The RUBBER AGE

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LATE NEWS of the Industry

Seiberling Scores Tire Companies for Cutthroat Selling Policies—

Urges Dealers to Force Manufacturers to Re-Establish Business on Sound Basis—Says Industry Must Face New Facts—Positive That It Can Be Made Profitable.

THE recent action of tire manufacturers in reducing tire prices by an additional 10 per cent discount to larger commercial accounts and in selling their products to large oil companies at or below the cost of these same products to their legitimate dealers was bitterly scored by F. A. Seiberling, president of the company which bears his name, in a recent letter to the independent tire dealers of this country, urging them to resist this latest move by forcing the manufacturers to inaugurate new policies which will re-establish the tire industry on a sound basis. Mr. Seiberling pointed out that this latest move to take away from the country's 75,000 tire dealers their legitimate business follows sales by manufacturers to mail order houses, chain service stations and outlets other than the independent dealers. These sales, made for the sake of volume have seriously disrupted the entire industry particularly by weakening the independent's retail structure, upon which its former success was founded.

"The tire industry must promote policies which will restore prosperity to the country's fourth largest manufacturing industry," Mr. Seiberling said. "It's time to face facts and execute an about-face away from recent unfair and destructive trade policies. The tire manufacturers must be made to realize that they can not continue to take away from these independent dealers the business which is rightfully theirs and without which they must be forced to liquidate. These men must again assume their rightful place as the bulwarks of the entire industry and in taking this action and speaking so plainly I am only trying to restore the trade policies which for twenty-one years made the tire industry a profitable industry."

Mr. Seiberling said that if his request to the dealers to rebel against the disastrous policies of tire manufacturers brings about a show down in the industry he is satisfied. He is positive that the tire business can be made a prosperous business which will contribute tremendously to the upturn of American business as a whole.

"The manufacturers must go back to old valuations," he said. "They must once again permit the independent dealer his legitimate place as the real background of all retail business. Only as they build up the independent dealers can they build up their business as a whole. The sooner they realize this just that much sooner will the industry be placed once again on a profitable plane."

The Akron dean of the rubber industry, long an outspoken and aggressive personality who has initiated within

Scanning the Headlines

SEIBERLING *takes another fling at tire price slashing and defends independent dealer . . .* GENERAL Tire and Rubber Company cuts profit by setting up special reserves . . . KELLY-SPRINGFIELD *reports loss in spite of increased sales . . . Rubber-tired Budd-Michelin rail coach runs successful tests in Philadelphia . . .* U. S. RUBBER *shows loss of nine and half million despite improved position . . . British rubber manufacturers census shows big increase in industry . . .* FORD *expected to use* 9,000,000 *tires on new models in* 1932 . . . FISK *records small loss for year . . .* MASTER *Tire and Rubber Corporation shows profit in its first year . . . Bank survey shows tire industry holding its own.*

the industry many sound and constructive trade practices, believes that the dealers themselves can make their influence felt to the extent that a turning point will be reached and the industry will face toward the prosperity of which it is inherently and fundamentally deserving.

"I hope my message will further provoke dealer comment from one end of the country to the other and that it will arouse the rubber world to action. The dealers of

"THIS HAS BEEN GOING ON FOR YEARS, UNCLE SAM. THE INDUSTRY IS DESTROYING IT'S BEST FRIENDS AND ITSELF! CAN'T YOU HELP US?"
RUBBER INDUSTRY
F.A. SEIBERLING
BILL TO ENCOURAGE INDUSTRIAL HARMONY
PRICE CUTS
LACK OF COOPERATION
RAILROAD WAGES
STOCK CERTIFICATES
DIVIDENDS
DEALERS' PROFITS

Courtesy of Akron Beacon Journal.

this country by girding themselves for action, both as individuals and through the operations of their official body, the National Tire Dealers Association, will make the manufacturers awake to the seriousness of present conditions. They can go far toward bringing about the inauguration of sane and constructive policies which will promote better conditions, insure stability, make for profits and prove to the country at large that the tire industry is capable of repeating the success which characterized its progress for several decades."

General Tire Reports $262,503 Profit But Loss After Reserve

THE General Tire and Rubber Company made a net profit of $262,503.77 for the fiscal year ending November 30, 1931, after deducting all charges, but before making provision for certain special reserves. When these special reserves are taken into consideration, the company actually lost $444,062.56 during 1931.

An operating profit of $587,187.65 was made before depreciation, interest and the special reserves, the report shows. Depreciation and interest charges amounted to $324,683.88, leaving a net profit of $262,503.77 before special reserves.

"The special reserves which the company has set aside include $409,034.62 to reduce the present market raw materials and material content of all unfinished and finished goods on hand," President O'Neil said.

"These special reserves also included $297,531.71 to provide for fluctuations in foreign exchange on all cash and all accounts receivable in foreign countries. In addition to this reserve, more than $200,000 was charged off during the year to operations because of losses in foreign business, largely in the Argentine, where the company's branch was closed."

The company's balance sheet, as of November 30, 1931, showed an extremely liquid condition with current assets of $7,309,965.33 against current liabilities of $1,454,633.85, or a current ratio of better than five to one, as compared with a current ratio of 3.78 to one on November 30, 1930.

Cash on hand was shown by the report to be $1,045,213.23 against notes payable to banks of $1,000,000. During the year, the company's indebtedness to banks was reduced from $1,950,000 to $1,000,000. The company has no bonded indebtedness.

The report showed that inventories, which are carried at the lower of cost or market, totaled $2,349,006.82, which is approximately 40 per cent below the close of the previous fiscal year and which indicates that inventory turnover should be approximately eight times during the year. Advances to dealers and investments in company-owned stores are carried in the company's balance sheet at $1 and all commitments have been written down to the present market, the report shows.

"We have provided out of surplus," Mr. O'Neil said, "a reserve of $1,250,000 against fluctuations in the price of raw materials. Of this amount, it probably will never be necessary to use more than one-half. We have also made provision from surplus for $1,817,345.60 to reduce advances to dealers and investments and real estate improvements in company-owned stores to $1.

Kelly-Springfield's Report Shows Loss Despite Substantial Cost Cuts

THE annual report of the Kelly-Springfield Tire Company, for the year ended December 31, 1931, shows net loss of $468,334 after interest, depreciation, inventory adjustments, foreign exchange losses, and after deducting $264,138 provision for possible price fluctuations in crude rubber. This compares with net loss in 1930 of $3,796,054 after interest, depreciation and after deducting $760,000 provision for market decline in raw material commitments.

The company states that operating profits for 1931, before deductions, were $1,002,334, that sales to dealers increased 4.22% last year in comparison with a decrease of 0.68% for the industry, and that operating expenses were reduced by more than $1,000,000 during the last nine months of the year.

W. H. Lalley, president, said: "The new board and management assumed control in the latter part of March, 1931. During the first quarter ending March, 1931, over which operations the present management had no control, the company sustained a loss in excess of $392,000. However, a net profit was made each month, starting May 1 up to and inclusive of October. The operations of November and December would also have been profitable if there had not been during those months a substantial cut in the price of tires by the industry.

"Our products and methods of manufacture have been consistently improved during the past nine months. The sales department has been aggressive and a considerable number of new worthwhile sales outlets have been established. These, together with a decidedly lower cost of operation in both manufacture and distribution, lead us to look forward to 1932 with much confidence.

"Last year at this time we were borrowing very substantially from the banks, while at the present time we have no bank loans, and indications are that it will not be necessary to do any borrowing during 1932. Our exceptional current ratio of 30 to 1 reflects our healthy financial condition."

Current assets as of December 31, last, including $1,-

748,399 cash, amounted to $8,428,775, and current liabilities were $275,726. This compares with cash of $508,850, current assets of $9,315,529, and current liabilities of $701,709 at close of 1930.

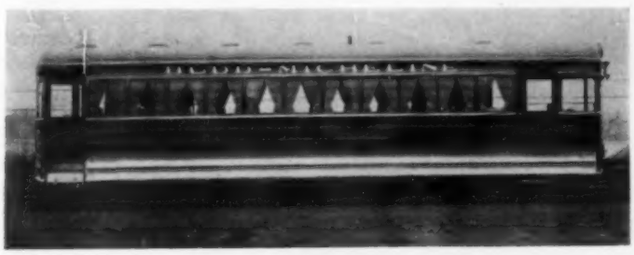
Rubber-Tired Rail Coach Carries Forty Passengers on Test Run

THE first stainless steel, self-powered, pneumatic-tired rail car built in the United States was given a test run on February 18, before a group of prominent bankers and railroad officials, on a trip between Philadelphia and Norristown, Pa., and return.

The newly developed pneumatic-tired railroad car which, its sponsors hope, will enable railroads to recover short-haul passenger traffic now lost to motor buses and save additional branch lines from abandonment, was pronounced a great success.

Frederic E. Wililamson, president of the New York Central Lines, one of the passengers carried along at sixty-five miles an hour by an ordinary eight-cylinder automobile engine installed temporarily in the car, said that the vehicle would "undoubtedly find its niche in the transportation scheme."

The car tested officially for the first time today, is a modification of the one introduced in France by the Michelin Tire Company. The American licensee, the Edward G. Budd Manufacturing Company of this city, adopted the



New Budd-Michelin Pneumatic Tired Rail Car

rubber tire but changed the car from an automobile on rails to a forty-foot railway coach and increased the seating capacity from twenty-four to forty passengers.

The coach, constructed of stainless steel instead of aluminum through a "shot-weld system" developed by the builders, weighs 13,500 pounds and travels on twelve wheels, each equipped with a specially designed tire carrying eighty-five pounds air pressure.

F. H. Russell, manager of the Budd-Michelin rail car division of the Budd plant, informed the visiting executives that in case of emergency the car could be operated with any or all of the tires deflated without danger of enrailment. Gasoline, Diesel or electric motors may be employed. Mr. Russell estimated that the car would make from eight to ten miles on a gallon of gasoline and about twelve miles per gallon of fuel oil. The operating cost, exclusive of man power, was placed at eleven or twelve cents a mile. Two employes ordinarily would be required for a car.

The windows of the coach do not open, but a ventilating system changes the air every four minutes and heats it when desired. The builders expect to get 20,000 miles from each set of pneumatic tires.

United States Rubber Co. Reports Its 1931 Losses at Over Nine Millions

THE annual report of the United States Rubber Company, for the year ended December 31, 1931, was announced on March 5 by F. B. Davis, Jr., president and chairman of the board of directors of the company.

Net sales for the year amounted to $114,132,055 after all discounts and allowances. Tires, which were distributed in certain localities by the United States Rubber Company in previous years, were sold during 1931 by the Samson Tire and Rubber Corporation of Los Angeles, Cal., and the Gillette Rubber Company of Eau Claire, Wis., controlled companies. The sales of these companies, amounting to more than $12,000,000, have not been consolidated with those of the United States Rubber Company.

Profit from operations for the year amounted to $630,858 after interest on funded indebtedness of $4,892,736 but before provision for depreciation of $9,672,924 and net adjustments of $431,338. The charge of surplus for the year amounted to $9,473,404, compared with $18,063,941 for 1930.

Total current assets were $62,605,970, of which cash amounted to $13,181,039. Total current and accrued liabilities were $7,625,039. The ratio of current assets to current liabilities was 8.21 to 1.

During the year bonds and notes of the company were bought for future redemption at a difference between par and purchase price, which resulted in a credit of $2,034,149. These purchases had an important effect in reducing interest on funded indebtedness from $5,576,791 in 1930 to $4,892,736 in 1931. Total outstanding funded and long term indebtedness was reduced $9,314,353 during the year.

Properties, plants and equipment had a net book value on December 31, 1930, of $94,056,883. Capital expenditures amounting to $3,650,705, less sales of properties and disposition of equipment having a book value of $702,966 and provision for depreciation of $9,672,924 caused a net reduction in book value of $6,725,185 for the year. The net book value on December 31, 1931, was $87,331,698.

The operations of the plantation properties of the company have been affected by the decline in the market price of crude rubber. Expenses have been greatly reduced and the rate for amortization has been adjusted to a basis which is more accurate in view of experience than the rate of accelerated amortization heretofore used. Production for the year amounted to 41,811,000 pounds compared with 36,620,000 pounds in 1930; 99,500 acres are planted and 72,000 acres are in bearing, with an average yield per acre of 581 pounds.

Consolidated income account for the year 1931 compares as follows:

	1931	1930	1929
Net sales	$114,132,054	$157,074,760	$192,962,040
Costs & Exp.	108,608,461	150,569,088	178,576,226
Oper. profit	$5,523,593	$6,505,672	$14,385,814
Deprec. res.	9,672,924	7,347,183	5,152,727
Pro. for pen.	.....	540,126	.....
Interest	4,892,735	5,576,790	5,918,063
Loss	$9,042,066	$6,958,427	*$3,315,024
Other income	.....	.....	.....
Loss	$9,042,066	$6,958,427	*$3,315,024
Sub. divs., etc.	192,475	21,714	17,689
Inv. adj., etc.	†1,871,654	11,083,799	2,721,326
Exp. of clo. plt.	401,357	.....	.....
Loss	$11,507,553	$18,063,940	*$576,009
Extra exp.	.....	.....	1,490,421
Prov. for add. depr.	.....	.....	‡2,464,000
Bond & note disc.	§2,034,149	.....	.....
Net loss	$9,473,404	$18,063,940	$3,378,412

*Profit. †After deducting $2,160,641 adjustment of prior reserves, previously set up. ‡Partly estimated extraordinary expenses incident to concentration and reorganization of operations. §Difference between par and purchase price of bonds and notes bought for redemption.

(Other news of the industry will be found on Pages 491-497)

Large Attendance at DETROIT MEETING *of* RUBBER DIVISION

Excellent Turnout Pleases Officers —Executive Committee Decides on Denver for Fall Meeting of Division

HOTEL FORT SHELBY

OVER 150 members and guests attended the spring semi-annual meeting of the Rubber Division, A. C. S., held on February 25 and 26 at the Fort Shelby Hotel, Detroit, Mich. Considering business conditions it had not been expected that the turn-out for this meeting would be particularly large, and the officers of the Division were gratified at the actual showing. In addition to two morning sessions at which twelve papers were presented and reports of committees read, the meeting included a trip by 65 members during the afternoon of February 25 through the plants of the U. S. Rubber Company and the Chrysler Corporation, and the banquet and entertainment in the Ball Room of the Hotel Fort Shelby on the evening of the same day.

Next Meeting Will Be Held in Denver

The executive committee, in a session held immediately after adjournment of the Division, announced that the next Fall meeting of the Rubber Division will be held in Denver, Colorado, where the regular annual meeting of the American Chemical Society will take place during the week of August 29-September 3. The executive committee felt that it was inadvisable to hold two successive meetings of the Rubber Division at locations or times differing from the regular meetings of the American Chemical Society. At the same time the committee agreed that with very active local rubber groups in Chicago and Los Angeles, a large attendance could be expected from the western and mid-western states. Chemists located in the East, it was suggested, can plan to take their vacations at the time of the meeting in Denver and in this way arrange to combine pleasure with duty. The Denver Chamber of Commerce has much available information on the points of interest in Colorado which is obtainable at no cost upon application.

In addition, the Gates Rubber Company, located in Denver, is anxious to act as host to the rubber division members and those who attend will not only have an opportunity of inspecting the Gates plant but they will also be entertained and assisted in every way to make their visit enjoyable and profitable.

At the start of the technical sessions, Chairman E. R. Bridgwater urged all present to participate as much as possible in the discussion on each paper. He stated that the probable cost of the meeting was $20,000 and to get one's money's worth each member should not only be an interested listener but he should also say what he had in mind on each paper.

Discussion was aided by the new policy of the Division, inaugurated in part for the first time at this meeting, of obtaining four copies of each paper in advance, two copies being sent to reviewers who would be expected to lead the discussion on that paper, and two copies to reviewers who would approve the paper for presentation. Members of the Division were asked to express their opinions of this plan, which was evolved by the Papers Committee, and also on the plan of omitting the name of the author on the copies of the papers sent to the reviewers. The report of the Papers Committee appears in full at the end of this article.

Of the twelve papers originally scheduled for the meeting, the titles and authors of which were given in full in the last issue of this journal, (THE RUBBER AGE, February 25, 1932, p. 440), the paper by Howard L. Wiley of Gates Rubber Company on "Rubber-Pigment Ratios in Batch Control" was not presented. An additional paper, however, was read by Dr. R. K. Lee, of Chrysler Corporation on "Automotive Rubber Problems."

The members who accepted the invitation to visit the U. S. Rubber Company and Chrysler factories were taken out to the rubber plant in two chartered busses and were provided with lunch in the company's attractive dining room overlooking the river before being taken through the huge tire factory. After a complete inspection tour during which every phase of the manufacture of U. S. Royal tires was shown, the group was transported to the Chrysler plant where every step in assembling the Plymouth car was disclosed.

Banquet

The banquet which was held in the Ball Room of the Hotel Fort Shelby at 7 P. M. following a "get-together" in the Egyptian Room at six o'clock for preliminary setting-up exercises, was attended by 132 members and guests. The local committee in charge provided an excellent dinner, entertaining entertainment and speechless speakers—thus making the evening completely enjoyable. Among the guests at the speakers' table were Dr. H. E. Howe, editor of *Industrial & Engineering Chemistry*, and Dr. R. K. Lee of Chrysler Corp. The entertainers, led by Detroit's "Tex" Guinan, consisted of the Gorgeous Sextette, a twelve-year old accordionist, an acrobatic dancer, comedy skit, a prima donna, quartette and piano player.

The local committee in charge of all arrangements is to be congratulated on the excellence of its plans and the success with which every detail was completed. The committee consisted of Dr. S. M. Cadwell, chairman; R. K. Lee, H. M. Marker, H. R. Wolf, B. J. Lemon, W. G. Nelson, J. P. Stanton, H. M. Northrup, and W. H. Graves.

At the business session, following the last paper, no new business was brought up. Reports of the Papers Committee and Physical Testing Committee were read and ap-

proved. These reports in full appear below. At the Executive Committee meeting, in addition to the decision to meet in Denver next Fall as already mentioned, it was decided to authorize the solicitation of advertising for "Rubber Chemistry and Technology" as a means of aiding in meeting the expenses of that journal, and to make a charge of $4.00 to honorary members of the division for their subscriptions to the journal.

Secretary's Report

Total membership of division, 527, of which 367 are full members, 64 associated members, 64 subscribers, and 32 honorary members. Members and associate members who have not paid 1932 dues, 117 and 51 respectively. Unpaid subscriptions, 24. New 1932 members, 19; new subscribers, 10; members and associates who have withdrawn, 14; subscribers withdrawn, 1.

Treasurer's Report

Balance in Bank, Sept. 1, 1931, at Buffalo meeting $1,270.92; received for dues and subscriptions $1,688.97, making total of $2,959.89. Expenses totaled $1,451.85, leaving balance on hand of $1,508.04.

Papers Committee's Report

In the absence of the chairman, Dr. H. L. Trumbull, the following report was given by Dr. H. L. Fisher:

The Committee has been canvassed for an expression of opinion in regard to Chairman Bridgwater's suggestion that in addition to the two formal reviewers appointed to approve the paper for presentation and publication, papers be submitted to at least two other reviewers who will be expected to lead a formal discussion at the meeting. The Committee is unanimous in approving this suggestion of Chairman Bridgewaters and suggests that the Rubber Division authorize that in the future all papers be submitted in quadruplicate, two copies of the paper to be sent out for formal review and approval and the other two copies for the review leading to the discussion. It is recommended by the Committee that this action be confirmed by the Rubber Division.

One member of the Committee has suggested that in the future when papers are sent to the various people for review the name of the author of the paper be omitted so that the paper will be considered solely on its merits. He expresses the opinion that reviewers may be influenced to a certain extent by their personal opinion of the author and that if the name of the author were withheld we might have a more unbiased and impartial review than those now obtained. At the time of this meeting not all the members of the Papers Committee have replied to letters which embodied this suggestion. It is, therefore, recommended that the matter be held in abeyance until the next meeting of the Rubber Division. Reports which are at present in the hands of the chairman of the Papers Committee are in disagreement on this point.

The members of the Division are asked to write to the chairman of the Papers Committee if they have any opinions for or against this proposal. These opinions can then be given consideration by the Committee before the matter is drawn up for consideration at the Fall Meeting.

Physical Testing Committee Report

In the absence of the chairman, R. P. Dinsmore, the following report was read by Warren H. Jones:

The project before the Physical Testing Committee at the present time consists in carrying out a survey of the industry on the methods and equipment in use in the performance of oven aging and oxygen bomb tests on rubber samples. Fifty-nine questionnaires have been returned to the committee. These have been classified into six divisions as follows:

Mechanical Goods Manufacturers	14
Tire Manufacturers	13
Commercial Laboratories and suppliers	13
Insulated Wire Manufacturers	5
Rubberized Fabrics	9
Footwear	5

The data from all these questionnaires have been classified and were summarized at a meeting of the Committee held in Akron on February 19. The committee met again at the Detroit meeting of the Division on Feb. 25th and after considering the summarized tabulations agreed on tentative recommended practices for oven and oxygen bomb aging. In the absence of the chairman and several members, these tentative practices are being circulated to the committee members for final study. When this work is completed the committee will present the proposed methods for consideration.

Abstracts of Papers

Some Experiences With a Direct Accelerator Absorption Test

F. H. Amon and R. K. Estelow, *Godfrey L. Cabot, Inc.*

A simple adsorption test has been applied to a large number of carbon blacks during its use as a production control test over a period of two years. The method is completely described and differs from previously described methods in that an extremely dilute solution of diphenylguanidine in benzene is employed. Significant differences in rate of cure are indicated by the direct adsorption test in case of channel blacks and several other pigment carbons. The test is not a measure of fundamental tensile or modulus characteristics. Use of the test in several separate laboratories indicates that it could be used generally by producer and consumer to evaluate carbon blacks.

Reactions During Vulcanization. II. The Reaction Between Zinc Soaps and Mercaptobenzothiazole

Harlan A. Depew, *New Jersey Zinc Co.**

Fatty acids react rapidly with zinc oxide to form zinc soaps during milling and accordingly the action of fatty acid in the presence of zinc oxide is the same as that of an equivalent amount of the corresponding zinc soap. In accelerated stocks, the zinc soaps in the mix react with the accelerator to form the active zinc accelerator compound. The equilibrium between the accelerator and zinc soaps results in the formation of a smaller amount of the zinc accelerator compound in the case of mercaptobenzothiazole than for many accelerators, and accordingly relatively large amounts of zinc soaps are required with it.

*This paper was prepared by Mr. Depew while he was connected with the N. J. Zinc Co., but he is now with the American Zinc Oxide Co.

View Showing Some of the 134 Members Who attended the Detroit Banquet of the Rubber Division

Heat-Resisting Inner Tube Stocks

E. W. Booth, *Rubber Service Laboratories Co.*

To develop heat-resisting inner tube stocks a method of testing called air-bomb aging was developed. Tests showed that low sulfur, 1 to 1.25 per cent; high acceleration, 2 per cent or more based on the rubber content; relatively high percentages of antioxidant and relatively high volume loading, 20 to 25 per cent based on the rubber content, were necessary to obtain a stock that would meet the requirements imposed by the air-bomb aging test.

Solubility of Organic Compounds in Rubber

T. C. Morris, *Goodyear Tire & Rubber Co.*

A method for determining the solubility of organic compounds in rubber has been developed. Apparatus consisting of a constant-temperature oven designed to permit microscopic observation of the material in the oven has been constructed to facilitate the use of this method. Solubility data have been obtained on a number of organic compounds now commercially available to the rubber trade. An application of the solubility data to molecular weight determination has been made.

Natural and Synthetic Rubber. IX. Constituents of the Rubber Hydrocarbon

Thomas Midgley, Jr., Albert L. Henne, and Mary W. Renoll, *Ohio State University*

Refractionation by temperature precipitation has been developed to separate the constituents of the rubber hydrocarbon from pale crepe. These are shown to be: 1. An insoluble component (20%); 2. A single soluble component (over 50%); 3. A highly soluble mixture (over 20%). A standard precipitation point was developed and used in these determinations.

A Method for Maintaining Uniformity in Factory Mixed Stocks

J. E. McCarty and Edward Cousins, *Kelly-Springfield Tire Co.*

A method based on determination of load at constant elongation has been developed whereby every factory mixed batch may be tested. Machine with special type jaws utilizing a new modification of the dumbbell strip has been designed for this purpose. Repeated experiments have shown that the new method gives results as good as are obtained with standard procedures. Experiments with curing times and temperatures, and with testing procedures are discussed. The method has been found to give consistant results over long periods of time and to be sensitive to variation in the stocks.

Studies in the Vulcanization of Rubber. V. Dielectric Constant and Power Factor of Vulcanized Rubber

Donald W. Kitchin, *Simplex Wire & Cable Co.*

This paper gives dielectric constant and power factor of rubber containing 2 to 32 per cent sulfur at 30°, 50°, 75°, and 100° C. from 600 to 2,000,000 cycles. The values vary greatly with composition, temperature, and frequency. The results do not disprove the dipole interpretation previously advanced, but show that it requires modification. Addition of sulfur to all the double bonds does not render the rubber molecule non-dipolar. The low dielectric constant of hard rubber at room temperature, which led to the idea of such compensation, is due to its rigidity. Its charge and discharge period is over 24 hours. At higher temperatures it softens, the period becomes short, and dielectric constant and power factor are high.

Studies by others of compressibility and thermal expansion reveal two states with a fairly sharp transition temperature: a hard state in which vulcanized rubber resembles a solid, and a soft state in which it behaves somewhat like a viscous liquid. The dielectric behavior gives additional support to the concept of solid and liquid states. The agents producing the electrical effects are not identical, but possess widely different relaxation times. The power factor of vulcanized rubber decreases on stretch. The actual dielectric mechanism is not revealed by the data.

Automotive Rubber Problems

R. K. Lee, *Chrysler Corporation*

The paper dealt with the difficulties experienced early in the development of rubber mountings, the seeming lack of cooperation of rubber manufacturers at this stage, and the latter installation of a rubber laboratory by Chrysler where all rubber product problems were solved before being turned over to outside companies for manufacture. The balance of the paper treated with the fundamental principles of physics and mechanics which were utilized in working out the theory behind Floating Power. Moments of inertia, vibrations, springs, etc., were all studied to the end that practically all of the impulses of the Chrysler engines absorb their own vibrations instead of transmitting them to the frame of the car.

Grit in Carbon Black. The Effect on the Flexing Resistance of Vulcanized Rubber

J. N. Street, *Firestone Tire & Rubber Co.*

Rubber channel black has been found to contain amounts of grit retainable on a 325-mesh screen varying from 0.05 per cent to 1.74 per cent. This residue is shown to be objectionable from the standpoint of the flexing resistance of rubber compounds, higher concentrations being correspondingly more harmful than lower concentrations. The coarser fractions appear to give rise to larger cracks and earlier appearance of cracking than the finer material. Even that which passes a 200-mesh screen but is retained on a 325 mesh is objectionable.

Effect of Curing Temperature on the Quality of Vulcanized Rubber

N. A. Shepard and J. N. Street, *Firestone Tire & Rubber Co.*

A review of the literature permits no definite conclusion concerning the influence of temperature of vulcanization on the ultimate quality of a rubber product. Some investigators claim equal properties at different curing temperatures, others superior properties at low temperatures, while still others believe superior qualities are obtainable at higher temperatures. Concerning the influence of temperature on aging, no conclusive data are available. The data presented in this paper concern a D.O.T.G. stock, containing reclaimed rubber and no antioxidant, and an M.B.T. stock, with an antioxidant. Original physical properties are presented, together with Geer oven aging, Bierer-Davis bomb aging, and natural aging. The data presented show that there is no influence of the temperature of cure on the tensile properties at maximum in the case of the D.O.T.G. stock, with a trend toward slightly higher tensile strength with decreasing curing temperature in the case of the M.B.T. stock. Natural, as well as artificial aging of the D.O.T.G. stock shows that the lower the temperature of cure the better the aging. The data on the M.B.T. stock show only a trend toward better aging with lower temperature of curing.

The Effect of Size and Shape of Pigment Particles on the Stiffness of Rubber

C. E. Barnett, *New Jersey Zinc Co.*

The effect of size and shape of pigment particles on the stiffness of rubber is studied from a theoretical standpoint. Resorting to analogies, the stress concentration is determined around large particles and the assumption made that the stresses are relatively the same for small particles. From the data obtained, the stiffening of rubber by pigments is explained on the basis that the rubber stress-strain curve changes shape.

The Effect of Cadmium Compounds on Typical Accelerators During Vulcanization

M. K. Easley and A. C. Eide, *American Zinc Oxide Co.*

Cadmium may occur in zinc oxide in the form of oxide, hydroxide, sulfate, sulfide, chloride, and carbonate in quantities up to 0.5 per cent or slightly more. Using 10 parts of zinc oxide which contains 0.5 per cent of cadmium, the latter would not exceed 0.05 parts on the rubber. Due to testing inaccuracies and the masking effect of impurities, small amounts of cadmium may be difficult to detect. To eliminate such complications, a base formula was selected using U. S. P. zinc oxide to which were added various amounts of cadmium compounds. With few exceptions, these compounds retard tetramethyl thiurammonosulfide but slightly advance the rate of cure of butyraldehyde aniline, di-ortho-tolylguanidine and mercaptobenzothiazole. General analytical practice is insufficient to identify the various forms of cadmium present and the action of cadmium-bearing zinc oxides is difficult to predict. Three samples of zinc oxide of the same manufacture gave widely different results with tetramethylthiurammonosulfide. Two samples of comparatively low cadmium content assayed approximately the same. One was fast and the other slow curing. The third assaying appreciably more cadmium produced an intermediate rate of cure.

A Review of RUBBER PRODUCTION *Trends in 1931*

Position of Estates Beginning of 1931—Malayan Small-Holders Production Increasing at Year-End—Large Ceylon Estates Cut Output 50 Per Cent—Dutch Native Output Larger Than Anticipated.

By E. G. HOLT

Chief, Rubber Division, Dept. of Commerce

THE beginning of 1931 found the price of rubber at unprecedented low levels; production at a high level everywhere except in Dutch native districts, and in Brazil; consumption holding up well in foreign countries but distressingly low in America, and world stocks of rubber higher than ever before in history. There was some hope that American consumption would improve during 1931, and an opinion was prevalent that governments of countries in the colonial possessions of which rubber was produced would take action calculated to prevent matters becoming much worse for rubber producers.

The close of the year found the price about half what it was a year previous. A temporary fillip to prices resulted from the Maxwell proposal for regulation of production and exports in March, 1931, and the concurrent discussions between British and Dutch producers. Failure of definite results caused a sharp reaction in April when prices reached a low not again recorded until July, when the 6 cent level was broken through. Since July the price has been shaved to a new low each month, averages being: August, 5⅜ cents; September, 5⅛ cents; October, 4⅞ cents; November and December, 4⅝ cents; and January, 1932, 4½ cents. February averaged approximately 4 cents.

Foreign Consumption Maintained

Consumption of rubber in foreign countries continued to be well maintained throughout 1931, although the total for the year was slightly lower than for 1930. Greatly increased takings in Japan and Czechoslovakia resulted from continued growth of the rubber footwear manufacturing industries in those countries, from which exports going to all parts of the world, have in the past three years seriously reduced the trade of other countries engaged in this branch of international commerce. Russia, apparently not relying overly much on results being obtained from local experiments in the production of crude rubber, imported close to 30,000 tons in 1931 against 16,229 in 1930. Australian takings increased above the abnormally low figure for 1930, and Austrian imports likewise, and tire manufacturing activities begun in Argentina increased consumption there. Despite these factors foreign absorption as a whole declined slightly owing to contraction of demand from France, where exceptionally large stocks had been accumulated during closing months of 1930, and from Germany, Canada, Italy, and Scandinavia. Slightly increased absorption was reported for Belgium and United Kingdom.

Consumption in America did not increase in line with hopes, although renewal sales of tires held up well until the third quarter. Original equipment tire demand fell off with automobile production. The domestic footwear trade was abnormally low, and this branch of American industry suffered more than others in the export field. New uses for rubber failed to materialize enough to perceptibly affect American consumption, and the total for the year was around 350,000 tons against 375,000 tons in 1930.

Position of Estates Beginning 1931

To this background of external events having an influence on rubber production should be added the general position of producers at the beginning of the year. Estates collectively had learned during 1929 and 1930 that by full production costs were reducible to a figure considered impossible previously. A fair number of the larger estates had contracts for 1931 delivery of a part of their output at prices above market levels. The decline in Dutch native output in the last half of 1930 lent color to an idea that having girded for battle to the finish, estates could outlast natives in the supply of rubber at low prices. Malayan native output was also declining gradually at that time. Finally since incorporated plantation companies operate under overhead and maintenance charges the same as do American manufacturing companies, they were faced with a choice between closing down absolutely and bearing overhead expenses from reserves, and the alternative of continued economical operation; they decided almost universally that at prices then current, they would lose less money by continued operation than by closing down. At the beginning of 1931, perhaps belief in restriction as an effective remedy was at low ebb among rubber planters, but there was always a chance that some official action might be taken which would make any company regret having gone out of production. This chance continued to influence decisions of company boards throughout 1931.

Malayan Estates' Production Trend

We will now consider the course of production during 1931 country by country. Official statistics of production for Malayan estates over 100 acres, available for the past three years, show that their 1931 production was maintained close to the level of the two preceding years. There has been no increase in production in line with the larger potential capacity; production has been slightly reduced, and the reduction appears to be more pronounced in December.

Estates under 100 acres in Malaya, assuming the accuracy of the official monthly statistics of calculated production, pursued a more erratic course during 1931. With the exchange situation bettered for them by the British abandonment of the gold standard, native production rose during the last part of the year showed a decided increase.

It thus appears that Malayan native production has been very quickly responsive to price conditions. For 1931 as a whole Malayan native production totaled about the same as for 1930, and Malayan estate production slightly above 1930 (affected by the May tapping holiday), but on the rate indicated by December figures alone, the natives would show an increase of 17,500 tons in a year and the estates would show an equal decline.

This indicated recent gain in native production is a little uncertain because of a question as to the close accuracy of the officially calculated statistics, and the indicated loss in estate production is for too short a period to be considered definitely established, but the next two or three months should throw light on the accuracy of these indications. So far as they go, they point toward decline in estate and increase in native production in Malaya.

Ceylon Estates Cut Output

Ceylon, the other British possession important in rubber production, lacking production statistics comparable to those for Malaya, must be considered on the basis of the export statistics, and statistics of production for 102 estates for which crop returns are regularly issued by the Rubber Growers' Association. Even on the basis of export statistics, which are much more regular than is production, the range is from a low of 6.14 per cent in May to a high of 9.64 per cent in December. Perhaps the lack of ideal climatic conditions in Ceylon is a most important competitive factor, which will explain in part the differences in production trend for Ceylon as compared to Malaya.

The Ceylon export statistics, removing normal seasonal fluctuations, follow the monthly trend of production of large estates (allowing a 2-months lag) with remarkable closeness during 1930 and 1931. The estates for which production is reported represented, in the last half of 1929, 41 per cent of total exports, and in the last half of 1931, only 24.5 per cent; in other words the production of smaller estates and of natives appears to have held up in Ceylon very much better than the production of large estates, assuming accuracy of the Rubber Growers' Association statistics. Again an indication appears that small-holders have maintained outputs better than large estates, and the Ceylon indications are stronger than those for Malaya.

Turning now to the Netherland East Indies, there are various sets of statistics from which to study the production trend. The Rubber Growers' Association issues monthly crop returns for 60 estates in Java and 60 in Sumatra. The export statistics for Java, where there is practically no native rubber growing industry, must represent total output of estates there. There are much more complete but less prompt official statistics on estate production published for Java and for the Outer Possessions by the local government. For Dutch native output we have the official reports of monthly exports in terms of dry weight for several years and up to September, 1931, and there are the more general monthly export statistics in terms of net weight.

Trend of Java Production

The Rubber Growers' Association statistics on estate production are very prompt and regular, and they represent a satisfactory proportion of the total both for Java and Sumatra.

Statistics for the 60 estates in Java show a higher rate of production in 1931 than in 1930 generally, and much better than in 1929, continuing the upward trend of recent years, but with a tendency to slow down slightly in the last four months of the year. Rubber exports from Java do not follow closely the estate production trend, unlike Ceylon, although the estates reporting production to the Rubber Growers' Association represent a larger portion of total exports than in the case of Ceylon. It seems to have been a not uncommon practice for Javan estates to accumulate stocks, sometimes for two or three months, before exporting. The trend of exports during 1931 was upward, the same as for estate production, but the exports for October and November, which should have been low as a result of the seasonal influence on production, actually set new high records for each month. Barring the very remote possibility that native rubber from Borneo, passing through Java, was included in the figures, the high October-November exports represented large stock accumulations. These shipments happened to coincide in point of time with the flood of rumors regarding possible cooperative action between the British and Dutch on restriction, which rumors held up the price for rubber to some extent toward the end of 1931; they also occurred after British abandonment of gold parity, which might have influenced holders of rubber to ship promptly. It is noteworthy that whereas the 60 estates reported a production representing 47.7 per cent of total exports in 1929, their share was slightly reduced to 46.0 per cent for 1931, which indicates that small estates in Java, as a whole, increased production at least as much as the 60 large estates, despite reports of some small producers having stopped production. Probably the slight decline in production of large estates in recent months is to be connected with the situation following British abandonment of gold parity.

For Sumatra as for Java, the trend of production judged from the figures for 60 estates, shows growth in 1931 over preceding years. Unlike Java, however, the Sumatran monthly production figures for 1931 show wide fluctuations from normal. In 1930 large estates in Sumatra cooperated in the May tapping holiday less than those in Java, but showed none of the increase in output during the next two months that marks Javan production. Sumatran production was abnormally high in 1931 in what are usually low production months, and low in high production months.

Dutch Native Output Large

We have already said that, seasonally considered, Dutch native rubber exports follow the same monthly trend, or nearly the same, as production in Malaya and on estates in the outer possessions of Netherlands India.

During the first half of 1931, the exports continued to increase, reacting sharply to the slight market firmness in March, and holding up well through June. Declines occurred in July and in August, but the rate did not fall to the extreme lows of September-October, 1930, and for the last four months of the year exports were at an annual rate around 75,000 tons well above that of the corresponding 1930 period.

Dutch natives produce lower grades of rubber than any other producers, their output passes through the hands of middlemen, and transportation charges to market exceed those of competitors. That production has continued as it has shows that in spite of receiving a mere pittance for his work, the native finds rubber the easiest available source of revenue, and while he has reacted more quickly to falling prices than other producers, his output has also reacted more sharply to the temporary price rises of the past year.

Production in India and in Indo China

The remaining districts which supply rubber are less important. British India, where seasonal causes influence production more than in any other area, had a sharply declining rate of output during 1931, and in closing months of the year the annual rate of exports was only about 4,500

(*Concluded on page* 489)

Carrying on Personnel Work in Good Times and Bad

Methods Employed at Norwalk Tire and Rubber Company—Complete Records Kept of All Present and Ex-Employes—Increase in the Rate of Performance of Factory Dutput is Largely Due to Efficient Personnel Handling

By Methew Hutchinson

Employment Manager, Norwalk Tire and Rubber Company, Norwalk, Conn.

As told to Francis A. Westbrook, M.E.

DURING the month of September the Norwalk Tire and Rubber Company dropped from an abnormally high production to probably 75 per cent of normal. We have not laid off anyone nor do we intend to do so, if we can possibly get around it by dropping the daily working schedule to five or six hours and a five-day week. In laying out production schedules, every effort is made to afford a balanced production in order to avoid a feast for some and a famine for others. So far we are meeting with gratifying success along these lines.

The reasons why we are making such a determined effort not to throw anybody out of work at this time is primarily that we feel, along with many other employers of labor, that we are under normal obligations to work for as many people as possible, especially for those who have dependents. Also during recent years we have carefully built up our organization, largely through the instrumentality of the employment department, to a point where it now consists of an unusually satisfactory staff of permanent and efficient help of both sexes. To have this broken up would be a most serious loss.

Work of Employment Department

To see how this has been accomplished and how we are managing to carry on at the present juncture, it will be worth while to describe briefly how the employment department is organized.

In the first place it should be stated that the normal number of employes is approximately 250. As employment manager, I do not have to give full time to interviewing and hiring help but am also responsible for the layout and execution of manufacturing schedules, issuance of working specifications, time studies and setting of rates. This is of great advantage when it comes to selecting help as we shall see.

When a foreman requires additional help, he fills out Form 73 (see illustration) and forwards it to the employment department which has it approved by the factory manager. If the foreman has any particular person in mind (sometimes employes apply to their foremen for the hiring of relatives or friends), he recommends hiring them. However, the judgment of the employment department is final as to whom is to be employed. Of course, whenever the new opening carries with it a rate of pay above the lowest levels, every effort is made to fill it by promoting an old employe.

Upon receipt of an employment request, I go through the application file to see if there are any on file by applicants who have had experience to qualify them for the particular job at hand. In the absence of any such particularly qualified applicants, I go through the list and, on the basis of the information on the card and carefully trained memory, I attempt to choose the man I think best fitted, considering age, weight, intelligence, general appearance and so forth. As I go to the factory gate each morning and briefly interview all applicants, I can, as a result of years of experience, retain for a considerable period an impression of the personalities of those whom we might some time wish to hire.

Without exception it has been our policy to secure local

married men with children whenever practicable, otherwise preference is given to ex-employes. In hiring ex-employes, w have the advantage of looking up their past record on Form 75A, which is shown in one of the illustrations and which will be explained later. These records are on file

for the past 17 years, since the inception of the company.

Finally to appreciate fully just what is meant by exercising judgment in the selection of employes, it must be borne in mind that I have made a careful study of every operation in the plant in minute detail and with a stopwatch. This, of course, is a great help in selecting men for the various jobs and placing them where they will do the best work and be most contented.

Even so, it happens that every once in a while we find that a foreman lays off a man mainly because we have attempted to put a square peg in a round hole, which results in unsatisfactory conditions not serious from the disciplinary standpoint. Many times an employe who has been laid off or discharged for a minor infraction of rules has been rehired and has made good in another department, simply because he was not placed right the first time.

We believe it is the best policy to permit the foreman to do the firing, because we provide him with the materials, tools, machinery, specifications, wage rate and personnel and expect him to produce. If the employment department attempts to interfere in his manipulation of any of these factors, he has a strong alibi that he cannot produce maximum due to causes beyond his control. If the foreman cannot stand on his own feet, we consider him incompetent and he is replaced.

Permanent Records Kept

When an employe is hired he is given Form 75 and he presents it to his foreman. This is reproduced in one of the illustrations. It is kept in the department where the employe works until he is transferred, laid off or discharged. Form 75A is kept in the employment department until Form 75 is turned in when the employe leaves the company, and then the information is transferred from the latter to Form 75A which is retained in the permanent "quit file." Thus the record for every employe, past and present, is kept for future reference.

Personnel work was undertaken in the past with a view to stabilizing the force of employes and thereby eliminating labor turnover and the wastes accompanying it. In our plant we had a full time registered nurse, with fully equipped dispensary for first-aid cases, and daily visits by a practicing physician. Any reported illness on the part of an employe resulted in a visit by the trained nurse, who gave advice regarding the illness, made an investigation of the living conditions of the employe's family and insisted on calling a doctor if the sickness seemed at all serious.

Periodical inspection of the factory was made by a committee for the purpose of discovering unsafe practices, accident hazards and unsanitary conditions. The necessary changes were recommended by this committee and corresponding action taken.

Recreation was provided by the building of a tennis court, by the forming of baseball, basketball and bowling teams and the holding of picnics and clambakes.

All this was pretty much the usual thing and we feel decidedly worth while. However, during the business depression we have found it necessary to reduce overhead expenses in every way possible for the time being.

For instance, the inspection committee which made periodic rounds of the factory to find accident hazards no longer functions in the same way. The reduction of overhead personnel naturally resulted in the addition of duties to the members of the organization who remained, and this was one of the features it was found necessary to drop.

We will not however, abandon our efforts on behalf of the employes in regard to accident prevention. Recently a "Council of Safety" was formed in Norwalk composed of representatives of fourteen local industrial plants, including ourselves. This has been organized by the Chamber of Commerce of the city and is sponsored by the National Safety Council. This organization meets once a month to discuss accidents which have occurred and interchange ideas as to the best methods of preventing them.

Work Under Present Conditions

At the present time the factory manager makes a daily round of the factory, taking notes of any untoward conditions which he sees and issuing instructions for their elimination or improvement. In addition to this daily inspection, we have a monthly inspection of the entire plant by a representative of our liability insurance company, who also makes recommendations for necessary changes. He makes notes and checks up on his next monthly visit to see that his recommendations have been carried out. This work, we feel, is adequate for the protection of our people even without the services of the old committee.

The visiting nurse likewise has been discontinued. Our file clerk, a girl who has had hospital training as a nurse, takes care of all first aid cases, and then sends them to the physician specified by the liability company. She also maintains the dispensary. If there is anything serious we can always call in the ambulance from the local hospital.

Recreational activities, insofar as they are an item of expense to the company, have also been dropped. With all this we cannot see that our employe relations have suffered in the least. The employes feel that in making every possible effort to supply them with at least some work, we are doing for them what they most need. In this way we are probably doing more to forward good relations than we did in the past. Times have changed and our methods have had to change with them.

That our efforts in building up the force of employes that we want has met with very considerable success cannot be doubted. For instance, I dare say it would have required 800 employes 10 years ago to equal the volume of production of the normal of 250 of today. The quality of the finished product, measured in value to the consumers on the basis of performance, would probably have rated 25 per cent of what it does today. There is absolutely no doubt that our personnel work has contributed greatly to this improvement. However, there are so many factors involved, that it is almost impossible to accurately gauge, or even attempt to state, just what this contribution represents in dollars and cents. It can be stated positively, nevertheless, that this function is just as essential to the success of the organization as any other function of management.

New TAG Indicator-Recorder

THE C. J. Tagliabue Manufacturing Company of Brooklyn, N. Y., manufacturers of recording and controlling instruments are now offering a new all metal automatic flue gas analyzer known as the TAG-MONO Indicator-Recorder.

The instrument indicates and records the per cent of CO_2 and also gives an accurate record of the per cent of combustibles, such as $CO + H_2$ which may be present in the flue gases. This is considered important in getting the whole story of what is taking place in the furnace.

The company reports that this new TAG development works on the orsat principle, analyzing chemically and indicating and recording electrically. The large illuminated dial and pointers can be seen at a distance of 30 feet. The records are made on a 9-inch, 24-hour circular chart with open graduations inviting a precise study of the continuous performance curve.

The Tagliabue Company has prepared a new catalog No. 1025. This book fully describes and illustrates the new TAG-MONO Indicator-Recorder and may be had by addressing the company.

Rubber Production in 1931

(*Continued from page* 486)

tons against actual exports of 10,782 tons in 1930. French Indo China, which has a regular seasonal export trend corresponding to production for Malaya, exported considerably more rubber in 1931, 11,819 tons, than in 1930, 10,289 tons; this was the result of subsidization of planters by the home government through an import tax imposed late in 1930 on all rubber imported into France. France apparently will support Indo-Chinese producers through the crisis; the means employed is possible of application neither by England nor Holland.

Exports from Sarawak were 10,310 tons in 1930 and 10,451 tons in 1931; exports from British North Borneo declined (9 months' figures) from 5,102 to 4,597 tons; from Siam, imports into Malaya declined only from 4,349 tons in 1930 to 4,218 tons in 1931; Amazon Valley shipments fell from 14,260 to 12,121 tons.

The year ended with United Stocks of rubber increased by 125,000 tons, and with stocks in Malaya and England slightly higher than a year previous.

Reclaimed rubber consumption gave continued evidence of this material having become established as a necessary compounding ingredient in rubber manufacture, although the percentage of reclaim used in compounds was perhaps 5 per cent less at the end than at the start of the year. The outlook for increased rubber consumption in 1932 seems but little more hopeful from the angle of either old or new uses than it did for 1931. World production continued in excess of world consumption to the beginning of 1932. The areas where production has been curtailed most during 1931, compared to 1930, are Ceylon (large estates) and British India; in neither country are climatic conditions ideal for rubber. Production of Malayan estates was at a slightly reduced rate during most of the year, while estate production in Sumatra, and Java most of the year, shows a rising trend.

Recent annual statements of most estate companies show that operations were conducted at a loss during the past year. In periods of price firmness during 1931, native producers both in Malaya and Netherlands India responded quickly with increased outputs.

It appears inevitable that during 1932 rubber production and consumption will be brought into closer balance. At present lower production rather than increased consumption seems likely to effect such a balance. Weakly financed rubber growing companies, and low yield estates, are today much in the position of wild rubber producers fifteen years ago, and must gradually at least (and perhaps very quickly) stop production, to be eventually superseded either by incorporated companies possessing exceptionally high yield estates, or by native small holders free from the burden of overhead and maintenance costs.

Adaptation of forestry methods to rubber cultivation, which is already practiced by natives, may be adopted by future organized companies.

Giant Tire Wrapping Machine

A NEW machine for wrapping giant truck and bus balloon tires has been developed by the Pierce Wrapping Machine Company, 625 W. Jackson Boulevard, Chicago, Ill.

The accompanying illustration shows the machine wrapping a 13.50-24 tire. Its range is from a 36x6" truck tire to and including tires of 14½" cross-section and 53" overall diameter. The shuttle opening is 14½", and can be made 15" if desired.

The shuttle is equipped to apply the glued wrap. By means of special fittings a thin film of glue is applied to the under side of the outer edge of the paper as the tire is being wrapped. This gives a completely sealed package.

Tire Wrapping Machine for Truck and Bus Balloon Casings

Should the wrapping be torn in one place, the entire cover will not become shabby, as it would if unglued.

The automatic printer is shown in the foreground of the illustration. This imprints a continuous indication on the wrapping of the tire, showing name, brand, or tread-design, with or without size. The machine is operated by a three horsepower motor, and the shuttle, which is of the open-gap type, is electrically controlled by a small ½ horsepower motor for raising and lowering which is accomplished by push-buttons.

A heavy Kraft, string-inserted or creped paper can be used, as desired, in widths from 2½ to 3¼". Where plain Kraft paper is used, the machine is ordinarily equipped with a double edgefolder, so that both the inner and outer edge of the wrapping is reinforced. This gives a substantial increase to the strength of the wrap at a very small additional cost.

The machine is usually operated at a shuttle speed of about 225 RPM, wrapping one of these large tires in about eighteen seconds.

The drums are rotatable in either direction and are grooved to give clearance to the printing. They are automatically adjusted for smaller or larger casings when the shuttle is lowered or raised.

Sponge Rubber Volume Costs

Present marketing conditions require very careful attention to the true costs of all types of rubber compounds. Probably the entire rubber industry now compute the cost of their solid rubber compounds on the volume basis, i. e., the pound cost is multiplied by the specific gravity. Sponge rubber presents a slightly different condition, because on account of the porosity of cured sponge, its specific gravity is quite low.—R. R. Olin Laboratories, Akron, Ohio.

EDITORIAL COMMENT

The Six-Hour Day

DEFINITE endorsement of the six-hour day, as a means of reducing unemployment, has been announced by officials of the Goodyear Tire and Rubber Company. The company is now running four shifts a day throughout 24 hours, six days a week. The decision to adopt this working schedule was not taken suddenly or without trials at other schemes, according to the statement of Paul W. Litchfield, president of the company.

"Several plans were tried out in the last 18 months in the effort to keep as many people as possible in an earning position," said Mr. Litchfield. "The short day seems definitely the best plan from the standpoint of manufacturing efficiency, and has kept on the payroll here some 3,000 men whom otherwise we would have had to let go.

"While the short hour day may not be applicable to every industry, or all parts of the same industry, I am convinced that, if adopted generally and wherever possible, it would put millions of men into a position where they would be self-supporting."

The six-hour day was initiated in the fall of 1930 after exhaustive study and has been watched closely since. It had always been the policy of the company, Litchfield stated, to shorten hours to meet seasonal fluctuations rather than lay men off. This was done in the past however by going to a 5½-day week or a five-day or shorter week. But more drastic reductions became necessary.

One experiment tried by the company was that of staggering employment, giving employes one week off in seven, then one in six, and one in five, making the work go as far as possible. This plan was confusing and difficult to administer, requiring men to be shifted about in some cases from their own department to another where they were less familiar with operations.

So the six-hour day was tried out. It proved simple to operate, keeping machines and power plant busy through the 24 hours, and keeping experienced men on jobs at which they were skilled; it also served the purpose of holding jobs for the maximum number of men.

This simple solution of the unemployment situation is applicable to other rubber manufacturing establishments and may prove an easy and beneficial arrangement for adoption in other rubber factory centers.

Trade Promotion Work

A BRILLIANT example of what can be done in the field of trade promotion by trade associations is seen in the efforts of the British Rubber Growers' Association. Not an opportunity passes that body to push before the British public the excellence of British rubber manufactured goods and the many uses to which rubber can be utilized. It is understood that the general set-up of our own Rubber Manufacturers' Association does not permit of such elaborate sales propaganda campaigns, but the times are propitious for some such concerted action on the part of domestic manufacturers, whether through the Rubber Manufacturers' Association or some other agency which they might jointly set up.

The promotional work of American trade associations has played a vital role in the development of numerous industries in the last decade, as shown in the record of the Trade Association Department of the Chamber of Commerce of the United States.

In the last ten years, the gas industry added more than 4,600,00 customers, an increase of 40 per cent. Sales of gas in the same period increased 110 per cent. Part of this growth, it is pointed out, was due to the additional number of consumers, but a substantial portion of the increase was attributed to the intensive development of existing markets through the promotional efforts of the American Gas Association.

In 1926, the association adopted a five-year program to stimulate the use of gas. Briefly, it provided for cooperation within and without the industry, for improved selling methods, stimulation of selling efforts, a greater understanding and appreciation of gas service; it provided for educational campaigns, proper rate structures and their application, and for technical research, national advertising campaigns, and numerous other activities, all directed toward planning and charting a definite course of action for the entire industry.

What can be done for the consumption of gas can well be done in an industry such as the rubber goods manufacturing industry, which boasts of over 30,000 separate items of rubber manufacture. A trade promotion campaign, enlisting the support of the entire industry, could not fail to have a beneficial reaction on the sales records of the individual rubber companies.

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General Manager.....PETER P. PINTO
Managing Editor.....J. P. BUSHNELL
Circulation Manager.....M. A. KRAMER

Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

TIRE INDUSTRY HOLDING OWN SAYS BANK SURVEY

That the tire industry is faring better than many other lines and is proceeding at a rate much more normal than that of business as a whole, is the opinion expressed in a recent survey published by the Union Trust Company of Cleveland, O.

"There is no valid reason to expect that the production of automobile tires will be appreciably larger in 1932 than it was in 1931," the bank says, "although a comparable production should show improved net earnings because of decreased costs.

"The tire business for last year did not show the drastic curtailment which was evident in automobile production and sales. In 1931 a loss of approximately 30 per cent was registered in car and truck sales, while tire sales were off but 9 per cent from the previous year. In spite of two years of depression the tire business is running at better than 70 per cent of 1929 totals, which is a showing made by but few manufacturing businesses in the country.

"Car and truck makers anticipate a gain in output of possibly half a million units in 1932 over 1931, but if the scrappage rate does not exceed that of 1931, this increase would no more than hold stationary the number of cars and trucks in use which constitute the potential tire market.

"Statistics of the tire industry show a market reallocation of distribution during the depression years. Original equipment took 30 per cent of the tire output in 1929, 25 per cent in 1930, and 20 per cent in 1931. Renewal sales, on the other hand, took 66 per cent of the output in 1929, 70 per cent in 1930, and 76 per cent in 1931."

St. Joseph Lead Report

St. Joseph Lead Company and subsidiaries for the year 1931 reports a profit of $477,237 after interest, depreciation, Federal taxes and minority interest, but before depletion, equal to 34 cents a share on 1,950,465 shares. This compares with a profit before depletion in 1930 of $4,076,460, equal to $2.09 a share.

Net loss after depletion for 1931 amounted to $1,409,352, as against a net profit of $1,509,991, or 77 cents a share, in the previous year. The 1931 earnings exclude write-down of securities amounting to $101,146 which was charged against reserve for contingencies, comparing with a charge in 1930 of $243,855 for the loss on sale and write-down of securities.

Holstein Rubber Co. Sale

In compliance to a court order, the trustee in bankruptcy of the Holstein Rubber Company, Danbury, Conn., will sell at public auction, at 2 p. m., March 14, all machinery, equipment, manufactured goods, raw materials and office equipment and supplies of the company. The sale will take place on the premises of the company at Danbury. For terms and particulars, interested parties should communicate with Darius J. L. Spain, the trustee in bankruptcy, 1 Elm Street, Danbury, Conn.

Suit Against Fisk

A bill in equity was brought in Boston against Fisk Rubber Company, of Chicopee Falls, Mass., and certain directors charging company had falsified reports and should be held liable for an alleged defaulted $8,000,000 issue of sinking fund gold notes.

The bill was brought by Herman Katz of Chicago in Suffolk Superior Court. Katz said he held five of the $1,000 notes which were issued January 1, 1926. He said principal and semi-annual interest, due January 1, 1931, were defaulted, and alleged that reports as to assets and condition of the company from 1925 to 1930, inclusive, were false and that the defendant directors knew, or with reasonable examination could have known, them to be false.

REVEALS PRES. CLEVELAND CARRIED A RUBBER JAW

The story of how President Grover Cleveland was secretly operated on for a malignant growth of cancer in his mouth and how he spent the later years of his life with an artificial jaw made of vulcanized rubber is told in a book by Dr. James H. Toby, "Cancer—What Every One Should Know About It," recently published by Knopf. Silence surrounded the incident, which took place on the yacht of Commodore E. C. Benedict, because of the financial condition of the country at that time.

Dr. Tobey tells how after the growth had been removed "the yacht arrived at Buzzard's Bay and Mr. Cleveland walked ashore unassisted. At this time he was 56 years old and rather corpulent. Shortly thereafter Dr. K. C. Gibson, a New York dentist, fitted the President with an artificial jaw made of vulcanized rubber"

MASTER TIRE SHOWS PROFIT FIRST YEAR

A net profit for its first full year's operations, ended December 31, sufficient to cover full preferred dividend requirements and a small balance for common, was shown in a statement given out today for the Master Tire and Rubber Corporation by W. P. Cline, treasurer.

The company is a consolidation of the Falls Rubber Company of Akron and the Cooper Corporation and Giant Tire and Rubber Company of Findlay.

Operating profit was given at $361,726 on net sales of $3,749,128, with a net of $110,420 shown after depreciation and inventory write-downs were deducted.

Total current assets were listed at $1,062,633, with the plant and other assets valued at $1,875,921, a total of $2,938,554. Current liabilities are $438,291.

Master Tire and Rubber Corporation has outstanding 12,445 shares of preferred stock and 89,147 of common.

Increase in unit sales of 36.7 per cent, compared with a decrease in the tire industry as a whole of 4.4 per cent is shown by the report. Dollar sales were only 4 per cent under the 1930 figure.

January sales showed an increase of three times the volume of January last year and February promises to keep pace with the first month, according to F. C. Millhoff, vice-president.

Raybestos-Manhattan Report

During the year 1931 Raybestos-Manhattan, Inc., earned $553,992.97, or 85 cents per share, after charges of $565,505.46 for depreciation, but before charges of $453,763.14 for adjustments of inventories, Canadian Exchange, etc. In 1930 the company earned $1,156,770.12 or $1.71 per share, after inventory adjustments and provisions for depreciation and income taxes.

The directors declared a dividend of 25 cents per share, payable March 15, 1932, to stockholders of record at the close of business February 29, 1932.

Litchfield Threatened

P. W. Litchfield, president of Goodyear Tire and Rubber Company, was the recipient of an anonymous letter recently, threatened death in the event of failure to pay $500. A 19-year-old youth was later arrested and confessed to the crime.

FISK SHOWS SMALL NET LOSS FOR YEAR

A net loss of $128,517 for the period January 4 to December 31, 1931, for the Fisk Rubber Company, without provision for the cost of receivership, was reported by Charles A. Dana and John B. Pierce, receivers. Current assets also showed a decrease of $592,285.

The deficit had been unexpected, inasmuch as Fisk at the close of business on November 30 of last year showed a profit before cost of receivership of $73,051. Thus, during the single month of December the company appears to have suffered an operating loss of $201,568.

Mr. Pierce explained that during December the company wrote down its inventory and otherwise made adjustments to conform with the prevailing market.

Net current assets on December 31, 1931, were $15,204,993, compared with $15,797,278 on January 3, 1931. The receivers have disbursed up to December 31, 1931, in cash, in settlement of taxes, creditors' claims and contingent liabilities, $604,739.

"Operations since January 3, 1931, have shown favorable results despite the general depression in the tire industry and the handicaps incident to receivership. Pending confirmation of the reorganization the receivers, accordingly, propose to continue the manufacture and sale of tires and the maintenance of the business of the company on substantially the lines followed during the past year," the receivers state.

U. S. RUBBER ACQUIRES OFFICE BUILDING SITE

The United States Rubber Company, which several years ago leased the site, 108.1x126, at the southeast corner of Broadway and Fifty-eighth Street, New York City, N. Y., where it erected a twenty-story building which bears its name, which was so well known as 1790 Broadway, has purchased the fee to the corner from August Hecksher, thereby gaining complete control of the property.

The rubber company's lease of the land was at a net rental of $65,000 per annum. The first term of the lease expires May 1 next. The Fitzgerald estate sold the fee to the site four years ago for $1,100,000 to the Schulte Real Estate Company, which just before taking title disposed of the property to Mr. Heckscher. The Metropolitan Life Insurance Company made a loan of $800,000 running until 1939.

Goodrich to Increase Advertising

The B. F. Goodrich Company will increase its advertising budget substantially this year, P. C. Handerson, sales manager, told 200 salesmen and officials attending the recent sales advertising conference at Hotel Mayflower, Akron. Much of the increase will be devoted to newspaper advertising in co-operation with dealers.

Guy Gundaker, Jr., sales promotion manager, explained the activities projected for his department, and F. T. Tucker, in charge of tire advertising, outlined the complete tire advertising program.

While the appropriation will be larger this year than last, a changed program to add and train dealers, will necessitate a reapportioning. Magazines and metropolitan dailies will be used somewhat less, but the total for all newspapers will be doubled, most of the space being Goodrich's share of co-operative dealer campaigns.

Eighty per cent of the appropriation will be spent in magazines, newspapers and direct mail; 15 per cent for point-of-purchase advertising, and 5 per cent for remembrance advertising.

NORWALK SEEKS TO LIST NEW STOCK ON EXCHANGE

The Norwalk Tire and Rubber Company has made application to the New York Stock Exchange to list on notice of issuance 10,546 shares of new $50 par preferred stock and 202,730 shares of new common stock in connection with the exchange for its present outstanding preferred stock of $100 par value and common stock of $10 par value. One share of the new preferred stock and five shares of the new common stock will be issued in exchange for each share of preferred stock of $100 par value outstanding, and one share of the new common stock will be issued in exchange for each share of common stock at $10 par value now outstanding.

The new common stock will be carried on the balance sheet at a stated sum of $1 a share, or $202,730 for the total shares outstanding. The purpose of the change is to eliminate the impairment of capital suffered under the old capitalization. Pursuant to the new capitalization the item good will will be removed and property, plant and equipment will be written down to a more conservative figure. The capital changes will remove the deficit and create a surplus of $245,493. Listing application states that Norwalk Tire is operating at a profit.

Exchange Differentials

The adjustment committee of the Rubber Exchange of New York, Inc., has fixed the price differentials between the various grades of hevea plantation rubber which shall prevail on all deliveries against the Exchange for new "A" contracts for the month of March, 1932, as follows: No. 2 crepe (thick or thin) at 1 point; No. 2 ribbed smoked sheets at 8 points; No. 3 ribbed smoked sheets at 18 points; No. 4 ribbed smoked sheets at 30 points; No. 5 ribbed smoked sheets at 50 points. The limit of allowance on No. 2 crepe was fixed at 25 points and the allowance on rubber delivered in bales at 13 points.

Muscle Shoals Factory

E. S. Robbins, formerly of Dayton, O., has announced the purchase of the properties of the Rubber Products Corporation, Muscle Shoals City, Ala., and will operate the plant under the name of Robbins Tire and Rubber Company. It is reported that the new concern has made a sales contract for its products with the Skinner Tire and Rubber Company, Akron, O.

TIRE PATENT RULING EXPECTED BY JUNE 1

Final adjudication of the long legal battle testing the validity of patents owned by the United States Rubber Company with respect to the drum method of tire construction is anticipated on or about June 1, according to Carl D. Friebolin, special master appointed by federal court to decide the issue.

The Firestone Tire & Rubber Company is defendant in the action instituted by the United States Rubber Company more than three years ago. No claim for damages or for recovery of royalties is embraced in the present case, but if the United States Rubber Company is successful in supporting its patent claim, it is thought likely that action for unpaid royalties amounting to thousands of dollars will be started.

The special master has set April 1 as the date on which the United States Rubber Company must file its final argument. Firestone will have another month in which to reply.

Scrap Rubber Dealers to Meet

The annual meeting of the Scrap Rubber Division, National Association of Waste Trade Dealers, will be held at the Hotel Astor, New York, on Wednesday forenoon, March 16, at 11:30 o'clock. Practically all the large scrap rubber concerns represented in the Association and many members handling scrap rubber as one part of their business are expected to attend. Throughout the past two years the scrap rubber branch of the waste material industry has perhaps suffered more than many other branches of the business. The coming meeting is hoped to prove an opportune time for members engaged in that branch of the industry to meet and consider the problems surrounding the industry.

Goodyear Shares, Inc.

Goodear Shares, Inc., controlled by Commonwealth Securities, Inc., and Continental Shares, Inc., reports for 1931 total assets of $5,568,822. Investments, which consist solely of 285,105 shares of Goodear Tire and Rubber Company common stock costing $22,805,400, had indicated market value of $5,416,995. Capital stock of Goodear Shraes, Inc., consists of 1,000 no-par common shares, of which 200 are held by Commonwealth Securities, Inc., and 800 by Continental Shares, Inc.

Wholesale Tire Discounts

Leading tire companies have increased the wholesale discount from list prices on national and large commercial accounts to 20 per cent from 10 per cent. This action restores discount for large users to the same basis which had been prevailing for many years prior to December 1, 1931, when, coincident with cuts in list prices, the reduction from the 20 per cent level was effected.

At the same time truck tire dealers' base discount from the manufacturers has been restored to 27½ per cent from the 25 per cent level also established last December.

FORD EXPECTED TO NEED 9,000,000 NEW CASINGS

It is estimated that approximately 9,000,000 tires, besides millions of rubber fitting units, will be required by the Ford Motor Co. in its 1932 expansion program. Of the half billion dollars being poured by Henry Ford into industrial channels the rubber industry's share will be more than $40,000,000, it is estimated. Some $30,000,000 will be spent for tires, and the remainder for other rubber accessories.

Large initial orders already have been received by Firestone, Goodyear and Goodrich. Firestone may receive the major share of Ford's total business. Other motor car manufacturers, particularly Chevrolet, are increasing their demand for original tire equipment, it is learned, anticipating a spurt in automobile sales all along the line this spring.

Rubber companies are basing calculations on a Ford program for the current year calling for 1,800,000 cars, each taking five tires. The new Ford tire is size 5.25.18, the largest ever used as original equipment on this car. The new cars also will be equipped with a greater number of standard rubber fittings. The motor will be fully cushioned on rubber to reduce noise and vibration.

United Carbon Shows Gain

The balance sheet of United Carbon Company shows that land, buildings, wells, pipe lines, leaseholds and other permanent assets, less depreciation, are carried at $9,868,309 at the end of 1931. Included in this total are gas properties stated at a net value of $3,951,290, which were appraised as of January, 1931, at approximately $16,000,000. Twenty-nine wells, all productive, were drilled subsequent to the appraisal. Some additional leaseholds were acquired during the year, including about 6,000 acres in Potter County, Pa.

Oscar Nelson, president of the company, in a letter to stockholders said in part:

"Deliveries of natural gas have not yet equalled expectations but they are, nevertheless, showing a steady increase. Shipments of carbon black during the year increased 18 per cent over those of 1930."

Rubber Chemical Glossary

The January-February, 1932 issue of *The Vanderbilt News,* published by the R. T. Vanderbilt Company, 230 Park Avenue, New York City, N. Y., is entirely devoted to a comprehensive glossary of chemical and technical terms used in the rubber industry. The volume constitutes a valuable reference work on the subject and copies may be secured upon request to the Vanderbilt company.

As it appears, the glossary covers chemical, physical, electrical, textile x-ray, botanical and factory terms, all more or less directly connected with, or applicable to, rubber technology. No attempt has been made to list individual chemicals or compounding materials, but another glossary covering this latter subject will be included in a subsequent issue of the magazine.

Nelt Barr

Nelt Barr, president of the Barr Rubber Company, Sandusky, O., died suddenly of rapid bronchial pneumonia on February 20, at his home, a few hours after returning from a business trip to New York. He was taken ill on the train and failed to recognize the seriousness of his condition. Interment was in Ashland, the former home of the Barr family.

Mr. Barr organized the Barr Rubber Products Company 1920 in Lorain, O., and has been president since its inception. The

NELT BARR

company was moved to Sandusky in 1923. He was prominent in civic affairs and was elected to the City Commission last November.

Mr. Barr was born in Windsor, O., April 24, 1882. His first business venture was in the jewelry trade and it was not until 1917 that he became affiliated with the rubber manufacturing industry through a connection with the Faultless Rubber Company, Ashland, O., as production manager. However, after two years he resigned to go into the optical business.

A chance acquaintanceship, struck up in a Cleveland hotel, with A. H. Babcock, led to the establishment of the Barr Rubber Products Company, Mr. Babcock supplying the capital and Mr. Barr the technical and managerial experience.

The company has been very successful and is in a strong financial position. New development plans, started before Mr. Barr's death will be pushed by the present management, which is made up of men long associated with Mr. Barr and the company.

Farrel-Birmingham Meeting

The annual stockholders' meeting of the Farrel-Birmingham Company, Inc., was held at the main offices of the company at Ansonia, Conn., February 18, 1932, and re-elected the board of directors. Following the session the directors met and re-elected the following officers of the concern: Franklin Farrel, chairman of the board; Nelson W. Pickering, president; Alton Farrel, treasurer and George C. Bryant, secretary.

NET LOSS REPORTED BY AETNA RUBBER CO.

At the annual meeting of Aetna Rubber Co. of Ashtabula, held in Cleveland, February 16, S. T. Campbell, president of the company, said that his company wrote down inventories 15 per cent in 1931, but remarked that present abnormally low rubber price is a decided advantage, as it will allow the company to again engage in lines "which we were forced to discontinue three years ago."

An operating profit of $21,800 was reported by Aetna, but after allowance for depreciation, taxes, amortization and other charges, a net loss of $70,291 was recorded for the year ended Dec. 31, 1931. This compares with a deficit of $32,179 in 1930.

Current assets amount to $224,703, including $80,013 cash against current liabilities of $34,129. Current position showed ratio of 6½ to 1 against 5½ to 1 a year ago. Company has only 980 shares of preferred stock and $440,540 common capital represented by 88,108 shares of common.

Goodrich Fights Hoarding

The entire organization of the B. F. Goodrich Company, including all employees, dealers and representatives, numbering in excess of 60,000 people in the United States, were this week requested by James D. Tew, president of the company, to actively support the federal government's campaign to eliminate hoarding of funds.

In a bulletin sent to the entire Goodrich organization Mr. Tew said:

"The movement now under way throughout the United States, sponsored by President Hoover to eliminate the hoarding of funds is meeting with success and will undoubtedly speed the return of normal business.

"I consider this proposal of the President a constructive plan and one worthy of serious consideration by all employees of this company and its affiliated corporations. In my opinion it deserves your whole-hearted support."

Employe Wins $350 Award

N. L. Goldsberry, of Akron, O., recently received a $350 check from the Firestone Tire and Rubber Company suggestion board at its first February meeting. The total awards were $545.

Goldsberry's award, the largest for some time, is one of several he has received in recent years. He has been an employe of the company for 16 years and is now in Plant No. 1 tire room. His suggestion covers improvement in a manufacturing operation.

Republic Rubber Busy

The Republic Rubber Company, Youngstown, O., a subsidiary of Lee Rubber and Tire Company, reports sufficient orders on hand to operate on a 60 to 65 per cent capacity basis. The orders are for fire and other hose and automobile parts. No pneumatic tire casings are made at the Youngstown plant.

Rubber News Around the World

BRITISH RUBBER CENSUS SHOWS GREAT INCREASE

Like the Census of Manufactures, which is conducted in the United States every two years, England also conducts a periodical census, the last being that of 1930. The previous one was taken in 1924.

The British figures are called the "Census of Production" and those pertaining to the British rubber manufacturers were published in the February 4, 1932, issue of the *Board of Trade Journal*. The figures cover returns from 163 rubber manufacturing establishments throughout the United Kingdom.

Expressed in terms of total values, the output of the industry increased from £20,242,000 in 1924 to £23,720,000 in 1930. The total make of rubber in sheet and thread-form expanded from 43,270 tons in 1924 to 89,900 tons in 1930; whilst between the same periods production of casings for motor cars increased from 1,927,000 to 5,198,000. In regard to inner tubes no direct comparison with 1924 is possible, but for 1930 it is found that there were made 4,210,000 inner tubes for motor car tires, and 5,253,000 inner tubes for cycles, the number of tires for cycles made in 1930 being 6,798,000. In regard to solid tires, as might have been expected, production has shown a decline—namely, from 404,000 in 1924 to 226,000 in 1930. The amount of reclaimed rubber made in 1930 was 13,830 tons, of which 7,000 tons were sold or added to stock.

In regard to footwear, the quantity of rubber boots made by the British industry in 1930 was 103,000 dozen pairs, and that of rubber shoes, over-shoes, and galoshes 715,000 dozen pairs. For 1924 these figures were not recorded separately, the figure then given—namely, 985,000 dozen pairs—recording the make of both classes of rubber footwear combined. Despite the general impression that the use of rubber heels and soles is declining, it is found that output of these items increased from 3,700 tons in 1924 to 4,890 tons in 1930. The statistics also give details of mechanical rubber goods, waterproof piece-goods, rubber gloves, and surgical and dental appliances. In regard to machinery belting of balata, or rubber and canvas, it is seen that output expanded from 1,660 tons in 1924 to 2,680 tons in 1930.

With the development of the radio industry the demand for such insulation materials as ebonite has naturally expanded widely during the past few years, and in 1930 it is seen that there were manufactured 1,630 tons of ebonite and ebonite products, valued at £360,000, in addition to a quantity not stated, but valued at £56,000.

French Footwear Exports, 1931

All sorts of rubber boots and shoes and canvas rubber-soled shoes are reported in a single class in French official trade statistics, the quantity being shown in units of gross weight (kilos). During the calendar year 1931, France exported 1,393,400 gross kilos of rubber footwear as compared to 1,869,000 in the same period of 1930.

The leading markets were Switzerland, United Kingdom and Algeria.

Rubber Output Unchecked

Large rubber estates in Malaya of 100 acres or over, chiefly European-owned, produced 23,478 tons of rubber during January, compared with 21,249 tons during December, according to the monthly census figures for the far eastern industry forwarded to the Rubber Exchange of New York, Inc.

Estates 100 acres and smaller accounted for an output of 18,474 tons last month, against 18,588 tons in December. Stocks on estates increased from 20,083 tons at the end of December to 22,161 tons in January, while dealers' stocks of rubber at the same time declined from 27,024 tons to 26,468 tons.

British Research Ass'n Meets

Sir Robert Robertson, Government chemist, was the principal speaker at a luncheon on the occasion of the twelfth annual meeting of the Research Association of British Rubber Manufacturers, at the First Avenue Hotel, High Holborn, London, on February 2, presided over by Lieut.-Colonel J. Sealy Clarke, chairman of the Association.

Proposing the toast of the Association, Sir Robert Robertson said he would be sorry to see synthetic rubber take the place of the natural product. With nature producing rubber in such profusion and at such a low price, the natural product should be encouraged, rather than the spending of money on the synthetic process. The Association's records showed that many of the problems before the research workers had not yet reached solution, but very valuable work was in progress which demanded the full support of the industry.

The Chairman, responding, said some people had complained that the Association had accomplished little. Its staff, however, had contributed over 60 papers to the scientific and technical press, and nearly 25 per cent of the published matter in the *Transactions of the Institution of the Rubber Industry* originated from the laboratories at Croydon. Some 690 inquiries were dealt with last year by the information bureau, and 4,770 books were issued from the library.

Sir Frank Smith, secretary of the Department of Scientific and Industrial Research, responding to the toast of the guests, proposed by Mr. R. P. Rosling, vice-chairman of the Association, said there was a mistaken idea among some firms that by joining a research association they were giving up all their secrets and destroying their individuality. The more progressive firms, however, realized that membership of a research association was good for themselves as well as for other firms in the industry and for the community at large.

RUBBER-TIRED RAILCAR SUCCESSFUL IN BRITAIN

The first British demonstration has just been given of the new motor railcar with pneumatic tired wheels, which was originally tested at the end of last year on the French railways. In appearance the car, which has been designed by the Michelin Company, resembles a large road bus. It rests on ten wheels, three pairs in front and two in the rear, and the gauge of the tires is practically that of the small road bus, with the addition of rims fitted on the inside with a steel flange to grip the rails.

The demonstration was on a stretch of line between Bletchley and Oxford, a distance of 31 miles. At Bletchley a party of experts occupied the 24 well-sprung seats in the compartment intended for passengers. After a braking test the car, in charge of a driver and assistant in front, and a guard at the rear, was run at varying speeds, with a number of stops on the route to Oxford, where the passengers alighted to witness the crossing of a series of points at low and high speeds.

Speeded at 55 m.p.h. Without Vibration

The return journey was made in a non-stop run, the speedometer inside the passenger compartment registering 55 miles per hour for the greater part of the distance. The vibration at this high speed reminded passengers of that of the ordinary passenger bus, and the noise was materially less than that of a steam train Unless a passenger glanced out of the window at the rapidly moving scenery he was not reminded of the speed, even on attaining the 55 m. p. h., for there was no perceptible increase in the noise similar to that usually heard on a steam train.

The weight of the car is about 5½ tons, equal when empty to a deadweight per passenger of 448 lbs., compared with a deadweight by the ordinary steam train on branch lines of 2¾ tons per passenger. Larger models are being made which may be provided with a locomotive at either end.

British India Passes Dividend

The directors of the India Tyre and Rubber Company (British) announce that no further dividend will be paid on the preference shares in respect of the past year "owing to expenditure incurred in designing tyres, the necessary writing down of stock valuations, and other necessary adjustments in the accounts."

The company had a successful year in 1930, showing a doubling of the profit from £130,000 to £260,000. The participating preference shares are entitled to 7½ per cent (cumulative) and 20 per cent of profits. The directors state that the accounts for the last year are "in course of completion" and that it is hoped to hold the annual general meeting some time in April.

COURT ACTION FILED OVER 'WINGFOOT' EMBLEM

The right to use the famous "Wingfoot" trade of the Goodyear Tire and Rubber Company was recently challenged in the Massachusetts courts, where Robert E. May and Grace Guptill filed an attachment for $3,000,000 for alleged illegal use of the design.

They allege that Hervey E. Guptill, then a shoe manufacturer, registered the device as his trade-mark on May 12, 1903.

In their attachment they also name First and Second National banks of Boston, Devon Mills of New Bedford, Mass., and Goodyear Improvement Co. of Maine.

The winged foot of Goodyear first appeared as a trade-mark more than 20 years ago.

Goodyear's use of Mercury's foot as a brand mark goes back to the days of F. A. Seiberling as Goodyear's president.

Its application as a trade design was suggested to him by a statue of the Winged Mercury which stood on the Newell post of the old J. F. Seiberling home on E. Market street.

Firestone Safety Record

Firestone Tire and Rubber Company lately announced a 58 per cent reduction in plant accidents for 1931 as compared with 1930.

The tire building department of Firestone Plant 2 has completed 915 consecutive days without a single lost-time accident that required a worker to absent himself from work, the report said.

There were 42 departments in the plant that went for an entire year without a lost-time accident, and 24 departments where the safety record extends two years.

Eisbrouch Heads McClaren

At the meeting of the board of directors on February 17, following the annual meeting of stockholders of the newly reorganized McClaren Rubber Company, Charlotte, N. C., Irving Eisbrouch, vice-president and general manager of the old company and one of the incorporators of the new concern, was elected president.

Hall Is Mica Agent

The C. P. Hall Company, Akron, O., is now exclusive sales agents in the rubber industry for "Silver Sheen," "Silver White" and "Biotite" brands of mica, made by the English-Richmond Mica Corporation, Richmond, Va., which is a consolidation of the English Mica Company and the Richmond Mica Company.

Foote Bros. Elect Officers

At the annual meeting of the Foote Bros. Gear and Machine Co., held February 23, 1932, at their general offices, 215 No. Curtis St., Chicago, the following officers were elected: F. H. Fowler, president; W. A. Barr, vice-president; F. A. Emmons, vice-president; H. H. Bates, vice-president; A. L. Gray, secretary and treasurer.

Names in the News

JOHN A. MACMILLAN, president and general manager of the Dayton Rubber Manufacturing Company, Dayton, O., and Mrs. Patricia Moyer Baker, of Los Angeles, Cal., recently announced their marriage in Chicago, Ill., on January 27. Mrs. MacMillan is a talented artist and has done miniatures of many prominent persons.

C. W. SEIBERLING, vice-president of the Seiberling Rubber Company, was recently named as president of the new Ohio State Republican advisory committee for the coming political campaign. Mr. Seiberling recently donated 700 pairs of rubber soles and 200 pairs of heels to the school authorities of Kent, O., to be used in repairing the shoes of needy children in the public schools of the town.

F. A. WARREN, treasurer of Gutta Percha and Rubber, Ltd., Toronto, Canada, has been elected president of the company to fill the vacancy caused by the death of the late president, C. N. Candee. Owing to the resignation of the managing director, J. HERBERT COFFEY, JR., to take effect on April 1, Mr. Warren will also assume the duties of general manager on that date.

T. G. GRAHAM, vice-president of the B. F. Goodrich Company, recently spent a week at the Martha Mills, Silvertown, Ga., plant of the company.

RALPH H. MINER, of the Goodyear Tire and Rubber Company, recently spoke before the Cleveland Air-Mail Society on the subject of "Lighter-than-Air Transportation." J. T. KIDNEY, of the Goodyear safety department, also spoke before the O. U. A. M., of Hartville, O., on "Safety in Airship Building." On both occasions Goodyear motion pictures were shown.

RUSSELL V. CLINE has recently resigned as account executive of Sweeney and James Company, Cleveland, O., to become vice-president of Carpenter Advertising, Inc., also of Cleveland. Mr. Cline served the Firestone Tire and Rubber Company, in Akron, for 17 years, being at one time advertising manager.

OLIN C. WORK, formerly assistant factory manager at India Tire and Rubber Company, Mogadore, O., is now factory manager of the Armstrong Rubber Company, West Haven, Conn.

H. L. TRUMBULL, of the Goodrich laboratories, was the author of a leading article in a recent issue of *Industrial and Engineering Chemistry*, in which he stated that "creative instinct is the major requisite for success in any research enterprise." Dr. Trumbull said that "research is not an exotic organism requiring a protected environment for its existence, but it thrives best in an industry where active demands exist for its services."

C. B. O'CONNOR, general tire sales manager of B. F. Goodrich Company, headed the return of the sales and advertising staff executives who recently arrived back at Akron after a barnstorming tour of three weeks with the sales conference "show-boat." S. B. ROBERTSON, vice-president, and E. H. BARDER, tire division superintendent, remained on the Pacific coast.

C. E. LITTLE, former president of Beacon Falls Rubber Shoe Company, has been appointed vice-president in charge of sales of the Converse Rubber Company.

Mr. Little enters on his new duties with a preparatory training of unusual character. In his youth he worked as a bootmaker at the old Colchester Rubber Company and later in the cutting room of the Bourne Rubber Company in Providence. With the C. S. Sisson Company of Providence, shoe jobbers, he received a wide experience in office work and inside and outside selling.

When the Beacon Falls Rubber Shoe Company began business in 1899, Mr. Little went on the road as a salesman. Four years later he traveled eastern Pennsylvania for the Lambertville Rubber Company. In 1906 he became branch manager of the New York branch of the Beacon Falls Rubber Shoe Company, going from that position to become general sales manager of Beacon Falls.

During the war he was manager of the College Point factory in addition to his other duties. When the United States Rubber Company took over the management of the Beacon Falls Rubber Shoe Company, Mr. Little was appointed manager of the soles and heels division of the United States Rubber Company. In 1925 he returned to the Beacon Falls Rubber Shoe Co. as president, resigning from that position in June, 1931.

FRED J. WILSON, president and general manager of the Wilson Rubber Company, Canton, O., recently returned from a trip to England, where he established a branch plant at Slough, just outside London, for the manufacture of rubber specialties now being produced in the Canton plant. The move was prompted by the British tariff now levied on such American made goods.

D. M. GOODRICH, chairman of the board of directors of the B. F. Goodrich Company, and EARL S. SARGEANT, vice-president and general manager of the Canadian Goodrich, Ltd., Kitchener, Ont., visited Akron recently to confer with company officials and attend the sales and advertising conferences.

H. V. BROWN, manager of the office standards department of B. F. Goodrich Company, Akron, recently spoke at the annual conference of the Office Management Association, at Pittsburgh, Pa., on the subject, "Recent Office Economics."

STEEL WHEELS BLEND WITH COLORED TIRES

The new fad for colored tires to suit the color scheme of the car is more than a passing fancy according to Joseph Ledwinka, of the Edward G. Budd Manufacturing Company. Harmony in color schemes is coming in for a great deal of attention at the present time, this even being noted in upholstery where manufacturers are using pastel shades of the same color as is used on the exterior of the body.

The use of color on wheels has now been made possible by the extended adoption of steel as a wheel material. The colored tire with the all-steel wheel provides a perfect team as the color of the tire blends with that of the body and the color of the wheel can be made to harmonize.

The use of a colored side wall in the tire with an all-steel painted to blend with it will make a marked difference in the appearance of the car. A large percentage of the part of the car which is in view is taken up by the wheels and tires and since manufacturers have available a choice of steel, wire artillery or disc wheels to all of which paint will adhere, a wide variation in appearance can be secured.

Arthur Jones

Arthur Jones, President of the General Rubber Company, Ltd., died on February 26 at his home in London, England. His death was unexpected, a letter received at New York the day before his death having advised that he was recovering.

Mr. Jones was one of the best known men in the crude rubber circles of Great Britain and the Continent, and had served as Chairman of the Rubber Trade Association. He first became associated with the General Rubber Company in 1907, as Manager of the Liverpool office. In 1927 he became Managing Director of the General Rubber Company, Ltd., of London. In 1930 he was elected President of the General Rubber Company, and, though continuing as head of the organization in London, made frequent visits to the company's headquarters in New York.

Rubber Stock Quotations

	Last Price Mar. 5	Feb. 18	—1932— High	Low
Aetna	3	—	3	1¾
American Hard Rubber	—	—	—	—
Faultless	25	—	25	25
Firestone	14	12⅝	15	12
do. 6% pfd.	59	54½	59½	50¾
Fisk	½	¼	⅝	⅛
do. 1st pfd.	¼	½	⅞	¼
General	45	49¾	49¾	49¾
do. pfd.	60	60	—	—
Goodrich	4⅝	4¼	5⅝	3⅞
do pfd.	15	16	17	12
Goodyear	18	16½	18	12⅞
do. 1st pfd.	59½	54	59½	42
India	4½	7	7	—
Intercontinental	—	—	—	—
Kelly-Springfield	2⅝	2	2⅝	1
do. 6% pfd.	39⅞	29¾	39⅞	20
Lee	2	—	2½	2
Mohawk	2¼	2	2½	1
do. pfd.	20	20	—	—
Norwalk	1½	—	—	—
Pirelli	—	30⅞	30⅞	26⅞
Raybestos-Manhattan	10	10⅞	11½	9⅞
Seiberling	3½	4	4½	3½
do. pfd.	20	20	—	—
Thermoid	2	2½	3	2
U. S. Rubber	5¼	5	5⅝	3½
do. pfd.	10⅞	9	10⅞	7½

New Rubber Goods

George Washington Balloon

Appropriate to the bi-centennial celebrations of George Washington's birth, now taking place throughout the United States, the Oak Rubber Company, Ravenna, O., have offered an attractive colored balloon, imprinted with the portrait of the First President. Another suitable item, which the company has introduced for this special occasion, is a balloon showing the scene of Washington crossing the Delaware. Both of the balloons may be had with the slogan "Washington Bi-Centennial, 1732-1932," date line or other special copy.

Molded Hack Saw Grip

Reenforced frames with rubber pistol grips are the latest developments in hack saw construction. The new type of saw is the product of the Forsberg Manufacturing Company, Bridgeport, Conn. The rubber handle is molded under 75 tons pressure, with a steel insert inside of the frame, thus reducing tension. The frame of the saw itself can be adjusted 8 to 12 inches and the blades can be faced in four directions. Dealer costs for the frames are $4.00 per dozen. The manufacturers state that the rubber handles are practically unbreakable.

Rubber Hack Saw Handle

New Goodyear Tube

Announcement of a new Zeppelin super heavy duty, hermetically sealed inner tube for automobile tires is made by the Goodyear Tire & Rubber Co.

Outstanding feature of the product is the new Zeppelin construction, in which the interior of the tube is specially coated to prevent diffusion of air, the same as the gas cells of the *U.S.S. Akron* are treated to prevent loss of valuable helium gas. Then, by patented machinery the rim side of the tube is made extra heavy and of tough rubber to resist abrasion, chafing, cutting or excessive stretching against the rim where tubes get the hardest abuse.

The tube is two-color, red and black—black on the side applied against the rim in a tire and red on the tread side. Both are bevel welded and vulcanized in a union so as not to split. The tube is spliced by Goodyear's patented electric weld method and is made full circle molded and properly oversized.

Rubber Screw Driver Handle

The Forsberg Manufacturing Company, Bridgeport, Conn., are offering to the hardware and tool trade their "Supergrip" Whale Brand screw drivers with insulated rubber handles. The handles are molded under 75 tons pressure and are claimed to be almost unbreakable, and have fluted and knurled ridges to assure positive grip. A hexagon guard prevents the hand from slipping and touching the blade when used in electrical work. Four wings at the top of the blade, molded into the handle, form an anchorage and prevent turning, twisting or pulling away from the handle. The screw drivers are offered in all standard sizes.

Screw Driver with Rubber Handle

Shell Bag

A shell bag of rubberized fabric, designed for the use of duck hunters, is the latest item of manufacture among the products of the Chicago Rubber Clothing Company, Racine, Wis. It can also be used as a general utility bag and is made of two thicknesses of finely woven olive drab cotton rubberized together.

Incidentally, this year is the fiftieth anniversary of the founding of this company and they are strengthening their line so as to befit the occasion.

Thermoid Fan Belts

The Thermoid Rubber Company, Trenton, N. J., has just announced a new line of fan belts. This rounds out the Thermoid line which now numbers over twenty-five automotive replacement items.

INQUIRIES FROM READERS

(Address replies to the Editor, THE RUBBER AGE, *250 West 57th Street, New York City, N. Y., mentioning inquiry number.)*

Manufacturing Facilities Available

A mold shop and small manufacturing plant, in a position to handle the manufacture of molded articles for any small rubber company desiring such facilities, would like to get in touch with interested parties. Inquiry 31032.

Rubber Suspension for Automobile Wheels

British concern holding patents on novel four wheel suspension and stabilized steering is desirous of getting in touch with American rubber or automobile manufacturers. United States patents issued. Inquiry 22532-A.

Repair Rubber and Low Priced Tires, Tubes and Patches

Inquirer desires contact with manufacturer of repair rubber for use in tube repair kits, also low-priced unbranded tires, tubes and patches. Inquiry No. 22532-B.

Flexible Rubber Molds

Inquirer is desirous of making a contact with manufacturer of flexible rubber molds into which plaster-paris or cement may be poured and the mold easily removed. Inquiry No. 22532-D.

Rubber Tack and Screw Bumpers

Inquirer is in the market for considerable quantities of rubber tacks and screw bumpers and wishes to make contact with manufacturer in this line of rubber products. Inquiry No. 22532-E.

PERSONAL ITEMS

ARTHUR KELLY, who has just returned to the Akron headquarters of B. F. Goodrich Company after heading its Japanese subsidiary, the Yokohama Rubber Company, Ltd., Yokohama, for several years, was honored with a dinner by his associates.

Dr. Webster N. Jones, general superintendent of the Goodrich processing division, was toastmaster. Mr. Kelly, previous to his service in Japan, was in the processing laboratories, tire division and raw materials inspection branch of the Akron Goodrich factories and with the Pacific B. F. Goodrich Company at Los Angeles, Cal.

C. C. SLUSSER, vice-president and general manager, Goodyear Tire and Rubber Company, Akron, spoke before the Medina Foremen's Club, February 10.

F. R. LEE, vice-president of the Thermoid Rubber Company, Trenton, N. J., was recently elected first vice-president of the Asbestos Brake Lining Association.

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Five cents a word, minimum charge $2.00, payable in advance.
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250 West 57th St., New York City

HELP WANTED

HELP WANTED—A practical man with wide experience and thorough knowledge in manufacturing of toy balloons. Must be able to take entire supervision of erection of a factory in England. Write fully past experience, full particulars and salary required. Address Box 660, THE RUBBER AGE.

POSITION WANTED

GRADUATE CHEMIST, with wide experience in rubber industry, especially mechanical goods, tire accessories, drug sundries and latex. Competent to manage small factory, laboratory or manufacturing unit. Six years with present company but desires change. Age 28, married. Address Box 658, THE RUBBER AGE.

COST ACCOUNTANT—Experienced in mechanical rubber goods and tire manufacturing, also factory economics. Can install departmental cost system or elaborate on one now in use. Also experienced in purchasing and general accounting. Address Box 657, THE RUBBER AGE.

MECHANICAL ENGINEER, 9 years rubber manufacturing experience; all modern methods and developments of tires and accessories; plant layouts; design, improvement and construction of rubber working machinery and equipment; inventive research ability. Speak English and German; age 30, single. Address Box 653, THE RUBBER AGE.

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WANTED: One 6" or 8" high speed Tread Tubing Machine. Must be in first class condition. One late type tread die head. Furnish full details capacity, pounds per hour, h. p. required, length opening in die head. Quote lowest cash price. Address Box 659, THE RUBBER AGE.

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LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, MARCH 5, 1932

Crude Rubber

THE market failed again to respond to the slight strength of other commodities and reached new lows during the fortnight, going to 3.35 on the Exchange and 3½ on the outside trading. The continued unfavorable statistical position was further aggravated by the apparent failure in Amsterdam of the Dutch authorities to come to any definiteness regarding restriction plans. Trading on the Exchange was light and buying interest on the outside market was absent.

Shipments from the Far East still held up, thus continuing the already heavy stocks on hand. Shipments to the United States during February, from British Malaya, were reported at 26,131 tons as compared with 26,956 in January. Similar shipments in February 1931 totaled 26,714.

Prices quoted on the New York outside market at the close of March 5, were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-March		.03½@	.03⅝
April		.03½@	.03⅝
May-June		— @	.03¾
First Latex, crepe spot		.04½@	.04⅝
Amber Crepe, No. 2		— @	.03½
Amber Crepe, No. 3		— @	.03⅜
Amber Crepe, No. 4		— @	.03⅛
Brown Crepe, Clean thin		— @	.03½
Brown Crepe, rolled		— @	.03⅜
Liquid Latex, per gal.		.70 @	.80
Paras—			
Up-river, fine		.05 @	.05¼
Up-river, coarse		Nominal	
Acre Bolivian, fine		.05½@	.05¾
Caucho Ball, Upper		.02½@	.03
Centrals—			
Central scrap		.04 @	—
Esmeraldas		.04 @	—
Balata—			
Block, Ciudad		— @	.18

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers		
March	2⅛@	2⅜d
April	2⅛@	2⅜d
May	2⅜@	2½d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers		
Spot	2 @	2⅛d

Daily closing prices and sales on the Rubber Exchange of New York are given in the table below:

Reclaimed Rubber

Prices on reclaimed rubber showed a light decline over the last two weeks as a result of the sagging crude rubber prices, but it is still significant that reclaimed grades are selling at higher prices than ribbed smoked sheets and crepe, indicating that reclaimed has found a definite place in certain compounds and will not be easily displaced by low priced crude. Latest prices for various grades of reclaimed are as follows:

High Tensile			
Super-Reclaim Black	lb.	.05¼@	.05½
High Tensile Red	lb.	.05 @	.05¼
Shoe			
Unwashed	lb.	.05 @	.05¼
Washed	lb.	.06 @	.06¼
Tube			
No. 1 (Floating)	lb.	— @	.06½
No. 2 (Compounded)	lb.	.04¾@	.05
Tires			
Black	lb.	.04 @	.04¼
Black, selected tires	lb.	.04¼@	.04½
Dark Gray		.05 @	.05¼
Light Gray	lb.	.06¼@	.06½
White	lb.	.05½@	.05¾
Truck, Heavy Gravity	lb.	.05 @	.05¼
Truck, Light Gravity	lb.	.05¼@	.05½
Miscellaneous			
Mechanical blends	lb.	.03 @	.03½

Scrap Rubber

Accumulations of scrap stocks have become increasingly scarce in the light of the prevailing low prices. However, the continued demands from reclaimers has held up the market to approximately the same levels as have prevailed for the last few months. Prices have, therefore, remained unchanged as follows:

(Prices to Consumer)

Auto tire peelings	ton	19.00 @	21.00
Mixed auto	ton	8.00 @	8.25
Bicycle tires	ton	5.00 @	6.00
Clean solid truck tires	ton	23.50 @	25.00
Boots and shoes	ton	15.00 @	17.50
Arctics, untrimmed	ton	10.00 @	12.50
Inner tubes, No. 1	lb.	.03¼@	.03⅝
Inner tubes, No. 2, compounded	lb.	.01½@	.01⅝
Inner Tubes, Red	cwt.	1.40 @	1.50
Air Brake Hose	ton	9.00 @	10.00
Rubber Hose	ton	8.50 @	9.00

Cotton

COTTON prices have advanced over the fortnight, although the fluctuations have been sporatic and have not exhibited any sustained upward trend. There is no outstanding factor which would tend to give impetus to the market other than the general efforts of the Government in restoring confidence and the possible benefits to the sorely-tried cotton industry through the provisions of the Glass-Steagall Bill.

High, low and closing prices on the New York Cotton Exchange, as of March 4, were as follows:

	High	Low	Close	Close
		March 4		Feb. 18
Mar.	6.99	6.93	6.98	6.90
May	7.11	7.05	7.10	7.08
July	7.28	7.21	7.27	—

Tire Fabrics

In the absence of any buyer demand the prices of tire fabrics have remained practically constant, at the prevailing low levels. Late prices follow:

(Prices Net at the Mill)

CORD			
Peeler, carded, 23/4/3	lb.	.25 @	.25½
Peeler, carded, 23/5/3	lb.	.24½@	.25
Peeler, carded, 13/3/3	lb.	.22 @	.22½
Peeler, carded, 15/3/3	lb.	.22½@	.23
Egyptian, carded, 23/5/3	lb.	.33½@	.34½
Egyptian, combed, 23/5/3	lb.	.38½@	.39½
CHAFERS			
Carded, American, 8 oz.	lb.	.23 @	.23½
Carded, American, 10 oz.	lb.	.23 @	.23½
Carded, American, 12 oz.	lb.	.22½@	.23
Carded, American, 14 oz.	lb.	.20½@	.21
LENO BREAKER			
Carded, American, 8¼ oz.	lb.	.20 @	.25
Carded, American, 10¼ oz.	lb.	.20 @	.25
SQUARE WOVEN			
Carded, American, 17¼ oz. 23-11 ply	lb.	.24½@	.25
Carded, American, 17¼ oz. 10-ply	lb.	.20½@	.21

Sheetings

The proposed 6 months' curtailment in production of various sheeting constructions has not yet made itself felt in price levels and the market continues dull. Latest quotations follow:

40-inch, 2.50-yard	yd.	.05⅝@	.05¾
40-inch, 2.85-yard	yd.	.05⅛@	.05¼
40-inch, 3.15-yard	yd.	— @	.05⅝
40-inch, 3.60-yard	yd.	— @	.04¾
40-inch, 3.75-yard	yd.	— @	.04¼
40-inch, 4.25-yard	yd.	— @	.03⅞

Ducks

In the face of a dull market there has been little or no change in the prices on ducks since the first of the year. Late quotations follow:

Enameling	lb.	.16¾@	.17⅜
Belting and Hose	lb.	.18 @	.18½
Single filling	lb.	.08 @	.08¼
Double filling	lb.	.09½@	.09¾

Closing Prices on Rubber Exchange of New York, Inc.

No. 1 Standard Contract of 10 Tons

FROM FEBRUARY 19 TO MARCH 5, 1932

Date		Spot	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Sales
Feb.	19	3.96	3.90	3.97	4.03	4.09	4.16	4.23	4.28	4.34	4.41	4.48	4.56	4.65	—	52
	20	3.94	3.88	3.95	4.02	4.08	4.14	4.20	4.25	4.30	4.37	4.44	4.52	4.62	—	115
	23	3.90	3.83	3.90	3.95	4.00	4.07	4.15	4.20	4.26	4.33	4.40	4.48	4.58	—	88
	24	3.90	3.85	3.91	3.97	3.94	4.02	4.10	4.15	4.20	4.26	4.33	4.40	4.50	—	91
	25	3.86	3.69	3.68	3.76	3.84	3.91	3.98	4.03	4.07	4.16	4.24	4.33	4.42	—	214
	26	3.70	—	3.72	3.75	3.79	3.88	3.96	4.01	4.05	4.15	4.23	4.32	4.41	—	135
	27	3.68	—	3.64	3.71	3.78	3.87	3.96	4.02	4.08	4.15	4.22	4.30	4.39	—	62
	29	3.60	—	3.56	3.63	3.74	3.81	3.92	3.99	4.06	4.12	4.18	4.24	4.33	—	122
March	1	3.40	—	3.48	3.49	3.49	3.56	3.64	3.68	3.73	3.80	3.87	3.95	4.04	4.13	291
	2	3.40	—	3.38	3.44	3.49	3.55	3.62	3.68	3.75	3.82	3.89	3.97	4.06	4.15	156
	3	3.40	—	3.35	3.43	3.52	3.60	3.68	3.74	3.80	3.87	3.94	4.02	4.11	4.20	35
	4	3.50	—	3.50	3.57	3.65	3.71	3.77	3.85	3.93	3.99	4.04	4.09	4.18	4.27	61
	5	3.58	—	3.58	3.65	3.72	3.77	3.82	3.89	3.97	4.04	4.11	4.18	4.28	4.37	46

CHEMICALS

THERE has been a tendency to reduce prices slightly in certain anti-oxidants and accelerators with zinc oxide now quoted ¾c under previous prices. While the demand for chemicals in the rubber industry remains sluggish, chemical houses have been somewhat stimulated by the interest taken in new applications of latex in the textile, paper, leather and cordage industries, thus opening up new fields for items heretofore sold only to the rubber trade. Late prices are reported below:

ACCELERATORS

Organic			
A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.80 @	.95
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.		
Captax	lb		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.44½
Diphenylguanidine	lb.	.30 @	.32½
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½@	.40
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.58½@	.61
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R & H 397	lb.	.75 @	.76
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermio F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.20 @	.22
TMTT	lb.	3.00 @	3.25
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.		
Zimate	lb.	.50 @	.60
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.08½@	.08¾
Litharge, domestic	lb.	.06¼@	.07
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.35 @	.36
Ultramarine	lb.	.06 @	.32
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.30 @	.32
medium	lb.	.31 @	.33
dark	lb.	.34 @	.36
Chromium Oxide, bbl.	lb.	.34½@	.35½
Reds			
Antimony crimson, 15/17	lb.	.40 @	.44
sulfur, free	lb.	.56 @	.66
golden, 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.11
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.08¾@	—
Whites			
Lithopone, Albalith	lb.	.05¼@	.05¾
Lithopone, Azolith	lb.	.05¼@	.05¾
Titanium oxide	lb.	.21 @	—
Titanox B	lb.	.06½@	.07
Titanox C	lb.	.06½@	.07
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.05¾@	.06
ZZ (leaded)	lb.	.05½@	.05¾
Horsehead Brand:			
Special	lb.	.05¾@	.06
XX Green	lb.	.05¾@	.06
XX Red, lead free	lb.	.05¾@	.06
Kadox, black label	lb.	.09⅝@	.09⅞
blue label	lb.	.08⅝@	.08⅞
red label	lb.	.07¼@	.07½
St. Joe, black label	lb.	.05¾@	.06
green label	lb.	.05¾@	.06
red label	lb.	.05¾@	.06
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.05¾@	.06
Anaconda, selected lead free	lb.	.06¼@	.06½
White seal, bbls.	lb.	.10⅛@	.10⅜
Green seal	lb.	.09⅝@	.09⅞
Red seal	lb.	.08⅝@	.08⅞
Yellows			
Chrome	lb.	.16½@	.17
Ocher, domestic	lb.	.01⅝@	.02

BLACKS

Arrow "Aerfloted"			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. work, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05½@	.07
Bone, powdered	lb.	.05½@	.12½
Carbon, compressed	lb.	.03 @	.07
uncompressed	lb.	.03 @	.07
"Certified," Cabot			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. works, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05½@	.07
"Disperso" f.o.b. La.	lb.	.031 @	.071
f.o.b. Texas	lb.	.03 @	.07
Drop, bbls.	lb.	.05½@	.14
"Excello," compressed	lb.	.04 @	.08
"Fumonex"	lb.	.02½@	.06
"Gastex," f.o.b. Texas	lb.	.02½@	.04¼
Lampblack	lb.	.07 @	.10
"Micronex"			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. works, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05½@	.07
"Supreme"	lb.	.03 @	.07
Thermatomic—"P 33"	lb.	—	—
"Thermax"	lb.	—	—
United, "Dixie" and "Kosmos"			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. works, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05½@	.07
"Velvetex"	lb.	.02 @	.05

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½@	.12
Asbestine	ton	13.40 @	14.00
Barium carbonate	ton	56.50 @	57.00
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	75.00 @	90.00
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	60.00 @	70.00
heavy	ton	45.00 @	55.00
Clay, Kaolin, domestic	ton	8.00 @	9.00
Aerfloted, Suprex	ton	6.50 @	8.00
Colloidal	lb.	.05 @	.08
Congaree	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Par	ton		
Tensulite	ton	15.00 @	—
Glues, extra white	lb.	.20 @	.25
medium white	lb.	.16 @	.20
Kalite No. 1	ton	30.00 @	60.00
Kalite No. 3	ton	40.00 @	70.00
Magnesia, carbonate	lb.	.08¾@	.11
Mica	lb.	.04½@	—
Rotten Stone (powdered)	lb.	.02 @	.05
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	— @	2.57
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.75 @	2.00
Quaker	ton		
Superfine	ton	10.00 @	12.00
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.18½@	.22

MINERAL RUBBER

Genasco (factory	ton	40.00	@42.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Parmr, solid	ton		
Pioneer, MR, solid	ton	28.00	@48.00
Pioneer-granulated	ton	40.00	@42.00
R & H Hydro-Carbon	ton	50.00	@52.00
	ton	27.05	@29.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	— @	.26½
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.13 @	.17
Stearic, double pressed	lb.	.17 @	.22
Alkalies			
Caustic soda, 76%	cwt.	2.90 @	—
Soda ash, 58% C.L.	cwt.	1.17½@	—
Oils			
Corn, refined, bbls.	lb.	.07 @	.08¾
Cottonseed, crule		— @	.04½
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c.l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05½@	.06½
Palm Lagos	lb.	.04 @	.05
Niger	lb.	.03½@	.04
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08¼
Pigmentaroil	gal.	.18 @	.23
Pine, steam distilled	gal.	.54 @	.61
destructively distilled	gal.	.54 @	.55
Witco Palm Oil	lb.	.07½@	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt. bbl.		7.00 @	—
Rosin, grade K, 280 lb. bbl.		— @	4.60
Pigmentar	gal.	.18 @	.23
Tar Retort, 50 gal.	bbl.	13.50 @	15.00
Solvents			
Acetone, pure	lb.	— @	.10
Alcohol, denatured, No. 1 bbls.	gal.	.28 @	.29
Benzol, 90%	gal.	.20 @	.21
Carbon, bisulfide	lb.	.05½@	.06¼
Carbon, tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.28
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	— @	.37½
wood	gal.	— @	.40
destructively distilled	gal.	.35 @	—
Waxes			
Beeswax, white	lb.	.34 @	.36
Carnauba	lb.	.26 @	.28
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.06½@	.07
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02½@	—
White crude scale 124/126	lb.	.02½@	—
Refned, 125/127	lb.	.03¾@	—
Refined, 128/130	lb.	.03¾@	—
Refined, 135/137	lb.	.05½@	—
Refined, 138/140	lb.	.07¼@	—

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.66

SPECIALTIES

Aromatics—Rodo	lb.		
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.30
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.07 @	.09
White	lb.	.08 @	.14
Brown	lb.	.07 @	.11

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½@	.04½
Sulfur flour, Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags	cwt.	1.75 @	2.10
Telloy	lb.		
Vandex	lb.		

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

WHILE rubber consumption during January showed a gain, crude rubber shipments have been maintained at a high rate and the statistical position of the commodity has not improved. A total tonnage of 27,962 tons was used in the domestic industry as against 21,409 tons in December. But on the whole the last quarter was one of the worst in the last few years, from the standpoint of industrial activities. The Rubber Manufacturers Association estimated the total crude rubber stocks on hand in the United States at the end of January at 322,860 long tons, while rubber afloat to the United States on that date was reported at 77,244 tons.

Market prices during February reached the lowest in the history of the commodity and continued at around 3¾ cents into early March, without any immediate prospect of higher levels. The failure of the Dutch government to come to any restriction agreement has been the outstanding unfavorable factor in the crude rubber situation, as far as market trading is concerned.

In the face of low prices the position of reclaimed rubber becomes all the more remarkable. Apparently it is holding its own with but a slight reduction in its ratio to crude, in point of consumption.

Latest figures covering imports and exports from the leading producing and consuming centers have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	28.71	10,309	6,057,687	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,978	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,138	72,918,949	6.54	25,595	4,255,572	7.42	471,543
1929:							
July	43,944	19,342,147	19.65	3,424	1,590,411	20.73	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,232,217	20.80	34,578
Sept.	34,472	15,214,485	19.70	2,011	861,068	19.11	32,461
Oct.	38,163	16,192,261	18.94	2,614	1,190,510	20.33	35,549
Nov.	43,507	18,189,305	18.66	2,929	1,300,354	19.82	40,578
Dec.	42,962	17,573,330	18.27	2,745	1,007,279	16.38	40,207
1930:							
Jan.	47,496	17,793,563	16.72	3,144	1,077,415	15.30	44,352
Feb.	42,687	14,798,240	15.48	2,280	960,790	18.80	40,407
Mar.	44,976	14,653,243	14.54	3,187	1,192,708	16.71	41,789
Apr.	45,423	14,783,605	14.53	2,688	892,532	14.82	42,735
May	42,692	13,373,232	13.98	3,154	1,085,432	15.37	39,538
June	39,993	12,215,843	13.79	3,174	1,028,653	14.47	36,819
July	35,182	10,553,944	13.39	2,807	759,260	12.08	32,375
Aug.	35,713	9,666,362	12.08	2,357	655,773	12.42	33,356
Sept.	35,380	8,460,812	10.68	1,514	430,772	12.70	33,866
Oct.	46,069	9,893,980	9.59	2,432	419,325	7.70	43,637
Nov.	29,401	5,700,086	8.66	1,300	271,348	9.32	28,101
Dec.	37,300	7,175,242	8.59	2,168	542,197	11.17	35,132
1931:							
Jan.	36,307	7,190,591	8.84	1,706	350,480	9.17	34,601
Feb.	34,005	6,564,969	8.62	1,799	357,078	8.86	32,206
Mar.	40,393	7,356,505	8.13	2,800	534,180	8.52	37,593
Apr.	44,536	7,712,941	7.73	2,607	528,947	9.06	41,929
May	35,526	5,886,638	7.40	2,501	418,301	7.47	33,025
June	46,233	6,918,900	6.68	2,749	440,604	7.15	43,484
July	43,469	6,023,748	6.19	1,435	223,587	6.96	42,034
Aug.	38,669	5,138,404	5.93	2,324	345,953	6.65	36,345
Sept.	38,494	4,970,324	5.76	1,362	187,431	6.14	37,132
Oct.	41,131	4,803,582	5.21	1,527	203,574	5.95	39,604
Nov.	43,435	4,742,218	4.72	1,403	198,284	6.81	43,435
Dec.	53,536	5,610,129	4.68	2,462	326,382	5.91	51,070
1932:							
Jan.	33,221	3,387,505	4.55	1,524	185,466	5.43	31,697
Feb.							
Mar.							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1925	1926	1927	1928	1929	1930	1931	1932
Jan.	29,638	32,196	31,518	34,403	43,002	36,194	28,557	27,962
Feb.	29,761	31,136	30,137	33,702	41,594	33,302	28,797	——
Mar.	33,498	32,936	36,141	35,688	44,730	35,540	32,788	——
Apr	34,139	32,696	35,871	32,772	47,521	39,686	33,321	——
May	35,322	29,364	34,592	37,333	49,233	39,386	37,817	——
June	35,822	28,598	33,801	37,676	43,227	34,195	37,916	——
July	36,053	27,577	29,219	37,407	41,526	29,508	31,937	——
Aug.	35,909	34,533	33,460	42,927	38,274	30,850	27,586	——
Sept	31,691	32,904	27,214	39,882	34,707	25,515	23,638	——
Oct.	29,047	29,936	26,790	40,857	34,800	27,516	22,277	——
Nov.	28,253	28,080	26,792	37,461	27,659	23,691	22,943	——
Dec.	28,748	26,293	25,492	31,232	23,531	21,687	21,409	——
Totals	388,481	366,149	371,027	441,340	469,804	375,980	348,986	——

Figures on Quarterly Basis

Quarter	1925	1926	1927	1928	1929	1930	1931	1932
Jan./Mar.	95,263	94,301	99,216	103,558	128,565	101,610	89,652	——
Apr./June	104,099	87,109	103,242	103,500	139,292	112,229	107,755	——
July/Sept.	99,403	93,793	89,210	117,573	113,746	85,261	83,632	——
Oct./Dec.	85,789	83,212	80,860	117,597	84,872	72,020	65,645	——
Totals	384,644	358,415	372,528	442,227	466,475	371,120	346,684	——

Note—The Rubber Association estimates its monthly rubber consumption figues to be 80 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1930	1931	MONTHS	1930	1931
January	25,731,000	26,844,000	July	38,256,000	39,459,000
February	26,509,000	26,133,000	August	37,433,000	39,459,000
March	31,029,000	31,037,000	September	37,823,000	36,670,000
April	34,549,000	33,400,000	October	32,267,000	35,051,000
May	36,497,000	35,716,900	November	30,984,000	30,640,000
June	35,902,000	38,375,000	December	29,094,000	30,529,000

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	3	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave
1930																														
January	—	16¼	15⅝	15⅝	15⅝	15⅝	15⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝
February	—	16¼	15	16¼	16⅛	15⅝	15⅝	15⅝	16	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	16½	16½	16½	16½	15⅝	15⅝	16½	16	16	15⅝	15⅝	15⅝	15⅝	—	15⅝
March	15⅝	—	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	—	15⅝
April	15½	15½	15½	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	—	15¼
May	14⅝	14⅝	14⅝	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	—	14¼
June	—	13¾	13⅝	13⅝	13⅝	13⅝	12⅝	12¾	12¾	12¾	12¾	12¾	12¾	—	12¾	12¾	13⅜	13⅜	13⅜	12¾	12¾	12¾	12¾	12¾	12¾	12¾	13⅜	13⅜	—	13⅜
July	12¼	12¼	12	12	12	11⅝	11⅝	11¼	11⅝	11⅝	11⅝	11¼	11¼	11¼	11¼	11¼	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	10½	11¾
August	10⅝	10⅝	9⅝	10½	10½	10¼	10¼	10¼	10¼	10¼	10	9⅝	9⅝	9⅝	9⅝	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10	10
September	—	9⅝	9⅝	9⅝	9⅝	8⅝	8⅝	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛
October	7½	7½	8	8	8	8	8	7⅞	8	8	8	7⅞	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
November	8¼	8¼	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜
December	9½	9½	9¼	9¼	9¼	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜	9⅜
1931																														
January	—	8¾	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	—	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8⅜	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8⅜
February	—	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞
March	—	7⅝	8⅛	8⅛	8⅛	—	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
April	—	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝
May	6	6	6	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛
June	—	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜	6⅜
July	6¾	6¾	6¾	6¾	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½
August	5¾	5¾	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5¾	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝
September	5¼	5¼	4¾	4¾	4¾	4¾	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4⅝	4⅝
October	4¾	4¾	4½	4½	4½	4½	4½	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾	4¾
November	—	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜
December	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜
1932																														
January	—	—	—	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½
February	4⅜	4⅜	4⅜	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼
March	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½
April	—	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	45.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Month	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14	15.24	8.34
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97	15.85	7.70
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55	15.34	7.71
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.18	14.93	6.43
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46	14.24	6.49
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64	12.45	6.35
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30	11.24	6.37
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.59	9.96	5.38
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37	8.28	5.08
Oct.	19.78	26.93	31.13	98.01	42.50	34.82	18.83	19.67	8.20	4.87
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	16.62	9.01	4.65
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	16.12	9.05	4.64
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	20.55	11.98	6.17

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Dec.	Jan.	Feb.	Mar.	Day	Dec.	Jan.	Feb.	Mar.
1	2⅞	—	2⅞	2¼	17	3	—	2⅝	—
2	2⅞	—	2⅞	2¼	18	3⅛	3	2⅝	—
3	2⅞	—	2⅝	2¼	19	3¼	3	2⅝	—
4	3	3⅛	2⅝	2¼	20	—	3	2¾	—
5	3	3⅛	2⅝	—	21	3¼	3	—	—
6	—	3⅛	2⅝	—	22	3¼	3	2⅝	—
7	3	3⅛	—	—	23	3¼	3	2⅝	—
8	3	3⅛	2¾	—	24	3¼	—	2⅝	—
9	3	3⅛	2¾	—	25	—	3	2⅛	—
10	3¼	—	2⅝	—	26	—	3	2½	—
11	3¼	3¼	2⅝	—	27	—	3	2½	—
12	3⅛	3⅛	2¾	—	28	—	3	—	—
13	—	3⅛	2⅝	—	29	3¼	2⅞	2½	—
14	3⅛	3⅛	—	—	30	3¼	2⅞	—	—
15	3⅛	3⅛	2¾	—	31	3¼	—	—	—
16	3	3⅛	2⅝	—					

Average Monthly Price Per Pound

Month	1929 Pence	1930 Pence	1931 Pence	1932 Pence	Month	1929 Pence	1930 Pence	1931 Pence	1932 Pence
Jan.	9.942	7.471	4.160	3.052	Aug.	10.505	4.880	2.385	——
Feb.	11.875	7.948	3.823	2.760	Sept.	10.160	4.075	2.524	——
Mar.	12.135	7.595	3.822	——	Oct.	9.620	4.023	2.898	——
Apr.	10.490	7.391	3.082	——	Nov	8.442	4.440	2.890	——
May	10.717	6.926	3.035	——	Dec.	7.958	4.516	3.115	——
June	10.580	6.195	3.082	——	Average for				
July	11.065	5.648	3.048	——	Year	10.291	5.926	3.155	——

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Feb.	Mar.	Day of Month	Feb.	Mar.	Day of Month	Feb.	Mar.
1	6.80	7.00	11	6.70	——	21	——	——
2	6.60	7.20	12	——	——	22	——	——
3	6.60	7.10	13	6.85	——	23	6.95	——
4	6.65	7.15	14	——	——	24	7.05	——
5	6.65	——	15	6.85	——	25	7.15	——
6	6.75	——	16	6.85	——	26	7.05	——
7	——	——	17	6.90	——	27	7.05	——
8	6.70	——	18	7.05	——	28	——	——
9	6.65	——	19	7.05	——	29	7.00	——
10	6.55	——	19	7.05	——	30	——	——
						31	——	——

Average Monthly Price Per Pound

	1929 Cents	1930 Cents	1931 Cents	1932 Cents		1929 Cents	1930 Cents	1931 Cents	1932 Cents
Jan.	20.22	17.21	10.27	6.65	Aug.	18.62	12.03	7.21	——
Feb.	20.21	15.62	10.96	6.85	Sept.	18.83	10.85	6.52	——
Mar.	20.19	15.13	10.90	——	Oct.	18.46	10.63	6.32	——
Apr.	20.29	16.39	10.19	——	Nov.	17.53	10.96	6.44	——
May	19.41	16.43	9.38	——	Dec.	17.28	10.02	6.24	——
June	18.74	14.48	9.05	——	Average for				
July	18.62	13.10	9.28	——	Year	19.03	13.57	8.56	——

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1929	1930	1931	AFLOAT 1929	1930	1931	ON HAND AND AFLOAT 1929	1930	1931
Jan.	76,842	131,744	209,487	93,330	61,863	56,187	169,672	193,607	265,674
Feb.	90,058	143,863	212,833	75,790	63,404	63,680	165,848	207,267	276,513
Mar.	100,536	141,843	217,804	67,065	63,646	63,133	167,601	205,489	280,937
Apr.	107,659	148,272	228,382	65,798	63,261	56,700	173,457	211,533	285,082
May	97,192	146,179	220,799	65,793	68,168	73,564	162,985	214,347	294,363
June	92,061	151,551	225,536	54,668	58,657	69,421	146,729	210,209	294,957
July	92,535	152,001	234,822	46,145	58,326	66,873	138,680	210,327	301,695
Aug.	90,769	158,604	240,816	49,423	61,168	61,469	140,192	219,772	302,285
Sept.	84,362	169,927	254,324	55,758	60,923	62,420	148,120	230,851	316,744
Oct.	88,483	185,470	273,456	59,180	51,122	68,427	147,663	236,593	341,883
Nov.	92,219	189,925	292,493	62,358	52,538	77,443	154,577	242,463	369,936
Dec.	118,609	200,998	322,826	62,388	56,035	53,940	180,997	257,033	376,766

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1929	1930	1931	At end of	1929	1930	1931
Jan.	25,191	60,434	81,093	July	30,080	81,048	81,317
Feb.	25,554	64,557	82,265	Aug.	35,605	80,931	81,560
Mar.	28,214	68,923	84,736	Sept.	42,188	83,329	79,692
Apr.	31,368	74,676	86,982	Oct.	47,803	77,647	76,778
May	31,290	77,312	86,726	Nov.	52,454	76,887	73,911
June	31,025	80,260	83,071	Dec.	54,304	78,013	69,470

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1931					
October	79,246	78,735	78,704	78,465	76,698
November	76,323	75,256	74,322	73,207	
December	72,904	72,785	71,400	70,043	
1932					
January	69,504	68,967	68,272	67,545	67,157
February	67,410	67,824	67,314	65,923	

Stocks in Liverpool

1931					
October	54,677	55,518	55,276	55,797	56,816
November	56,284	55,933	56,339	56,366	
December	56,901	57,157	57,116	56,908	
1932					
January	57,718	57,652	58,662	58,328	58,182
February	59,155	59,874	59,514	59,868	

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1929	1930	1931	1932	End of	1929	1930	1931
Jan.	29,617	39,727	48,802	48,850	July	33,859	45,459	51,203
Feb.	32,373	44,371	49,283	——	Aug.	30,834	48,132	48,971
Mar.	29,437	45,657	49,590	——	Sept.	32,138	44,015	47,025
Apr.	26,474	48,473	45,868	——	Oct.	33,770	39,930	52,132
May	30,764	44,715	44,278	——	Nov.	30,963	41,674	46,497
June	30,403	42,451	47,517	——	Dec.	35,548	45,963	45,795

STOCKS IN OTHER CENTRES

1930 End of	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
1931:					
Jan.	41,620	24,500	3,168		5,124
Feb.	43,027	24,580	3,326		5,404
Mar.	40,227	21,990	3,622	3,857	4,843
Apr.	37,103	18,500	3,659		5,137
May	37,171	17,770	3,380		4,896
June	38,748	18,440	3,219	3,518	4,894
July	40,377	19,960	3,111		4,548
Aug.	40,606	18,880	3,204		4,571
Sept.	37,114	16,200	3,293	2,763	4,972
Oct.	35,381	17,800	3,100		5,465
Nov.	39,198	19,570	2,799		5,506
Dec.	41,219	20,140	2,568	3,607	5,576
1932:					
Jan.	43,938	20,000			6,342

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1927	19,700,003	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	26,001,664	66.8	1929	24,141,502	80.3
1926	24,199,524	75.3	1930	17,364,096	80.1
1931			1931		
January	681,301	67.9	July	812,642	74.0
February	1,010,774	73.9	August	924,236	80.8
March	1,425,336	81.4	September	504,879	70.4
April	1,717,652	79.9	October	281,749	62.7
May	1,508,349	83.7	November	638,138	78.0
June	1,084,707	77.3	December	714,037	80.1
1932					
January	810,759	89.0			

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1923	1924	1925	1926	1927	1928	1929	1930
Production	45,259	51,633	60,845	61,237	64,439	77,944	68,726	50,965
Shipments	45,204	50,120	59,262	59,002	64,059	74,296	69,395	53,638
Inventory[2]	5,772	7,427	8,142	10,456	10,264	13,624	11,838	9,003

Figures for Recent Months

	PRODUCTION 1929	1930	1931	SHIPMENTS 1929	1930	1931	INVENTORY 1929	1930	1931
Jan.	6,301	4,485	3,675	6,211	4,406	3,744	12,855	11,924	8,957
Feb.	6,479	4,555	3,985	4,951	4,195	3,402	14,525	11,410	9,536
Mar.	7,049	4,863	4,663	6,289	4,717	4,122	15,329	12,513	10,014
Apr.	7,391	5,648	4,944	6,838	5,089	4,932	15,870	13,076	10,031
May	7,636	5,717	5,679	6,735	5,216	5,415	16,733	13,432	10,312
June	6,847	5,122	5,672	6,800	5,294	5,572	16,497	13,277	10,447
July	6,320	3,991	4,926	7,364	5,447	5,462	15,034	11,812	9,919
Aug.	5,693	4,166	3,906	7,354	5,175	4,960	13,337	10,848	8,896
Sept.	4,460	3,365	3,172	5,623	4,405	3,932	12,070	9,812	8,158
Oct.	4,611	3,582	2,974	4,649	3,499	2,852	12,042	9,803	8,300
Nov.	3,378	2,654	2,500	3,355	2,834	2,887	12,127	9,595	7,919
Dec.	3,057	2,814	2,643	3,237	3,361	2,871	11,838	9,003	7,744

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1923	1924	1925	1926	1927	1928	1929	1930
Production	60,116	70,706	82,614	76,618	70,823	80,180	68,829	52,420
Shipments	59,072	68,106	81,004	71,591	72,896	77,127	70,592	54,938
Inventory[2]	8,425	11,052	11,313	16,200	13,692	16,117	12,807	9,999

Figures for Recent Months

	PRODUCTION 1929	1930	1931	SHIPMENTS 1929	1930	1931	INVENTORY 1929	1930	1931
Jan.	6,109	4,607	3,623	6,789	4,857	4,062	14,424	12,704	9,439
Feb.	6,346	4,634	3,916	4,948	4,337	3,400	15,936	13,036	9,921
Mar.	7,000	4,941	4,450	6,317	4,727	3,789	16,641	13,179	10,475
Apr.	7,157	5,510	4,617	6,716	4,848	4,636	17,000	13,784	10,413
May	7,181	5,535	5,413	6,598	5,074	5,281	17,745	13,852	10,549
June	6,542	4,950	5,358	6,515	5,265	5,397	17,294	13,612	10,504
July	5,793	3,939	4,955	7,605	5,855	5,831	15,311	11,657	9,589
Aug.	5,481	4,796	4,435	7,672	5,762	5,301	13,072	10,737	8,774
Sept.	5,190	3,817	3,449	5,859	4,541	4,150	12,585	10,065	8,095
Oct.	5,000	3,951	3,077	4,689	3,472	2,813	12,802	10,517	8,321
Nov.	3,544	2,680	2,443	3,480	2,788	2,594	12,845	10,313	8,119
Dec.	3,484	3,060	2,597	3,404	3,412	2,767	12,807	9,999	7,922

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States Total	Passenger Cars	Trucks	Canada Total	Passenger Cars	Trucks	Grand Total
1926	4,298,799	3,808,753	490,046	205,002	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,850	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930							
Jan.	275,089	235,099	37,990	10,388	8,856	1,532	283,477
Feb.	346,940	297,483	49,457	15,548	13,021	2,527	362,488
March	401,378	336,178	64,200	20,730	17,165	3,565	422,108
April	442,530	375,171	67,459	24,257	20,872	3,385	466,887
May	417,154	362,784	54,370	24,672	21,251	3,421	441,826
June	335,475	289,704	45,771	15,090	12,194	2,896	350,565
July	262,363	222,700	39,663	10,188	8,556	1,632	272,551
Aug.	224,368	187,288	35,758	9,792	6,946	2,846	234,160
Sept.	216,877	175,720	41,157	7,957	5,623	2,334	224,834
Oct.	150,044	112,800	37,244	4,541	3,206	1,335	154,585
Nov.	135,752	102,957	32,795	5,407	3,527	1,880	141,159
Dec.	155,701	124,173	31,528	5,622	4,225	1,397	161,323
Total	3,365,986	2,814,452	540,584	154,192	125,442	28,750	3,510,178
1931							
Jan.	171,848	138,317	33,531	6,496	4,552	1,944	178,344
Feb.	219,940	180,419	39,521	9,871	7,529	2,342	229,811
Mar.	276,405	231,244	45,161	12,993	10,483	2,510	289,398
Apr.	336,939	285,693	50,015	17,159	14,043	3,116	354,098
May	317,163	269,420	45,695	12,738	10,621	2,117	329,901
June	250,640	208,158	41,304	6,835	5,583	1,252	257,475
July	218,490	183,107	35,854	4,220	3,151	1,069	222,710
Aug.	187,197	155,425	31,772	4,544	3,426	1,118	191,741
Sept.	140,566	109,228	31,338	2,646	2,108	538	143,212
Oct.	80,142	58,415	21,727	1,440	761	679	81,582
Nov.	68,867	49,184	19,683	1,247	812	435	70,114
Dec.	121,533	97,897	23,636	2,432	408	2,024	123,965
Total	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932							
Jan.	119,344	98,785	20,541	3,731	3,112	619	123,075

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[6]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,866
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,580
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1930:															
Jan.	52,535	11,773	40,762	7,741	1,560	791	642	386	5,709	7,831	8,928	856	1,837	585	77,628
Feb.	48,947	12,960	35,987	8,055	1,245	847	642	469	6,900	7,191	11,414	944	1,787	480	75,961
Mar.	47,320	12,236	35,084	6,617	1,219	976	642	391	5,796	6,612	11,214	643	1,674	536	71,314
Apr.	43,803	14,627	29,176	4,444	856	1,026	502	366	4,802	6,326	12,724	433	1,201	630	62,486
May	49,016	13,253	35,763	5,968	975	917	502	350	6,352	6,661	12,041	753	1,383	555	72,220
June	36,607	12,120	24,487	4,577	778	1,040	201	392	4,728	4,776	9,512	425	974	551	52,441
July	41,347	12,759	28,588	3,868	792	1,087	600	327	6,022	5,891	9,770	648	810	418	58,821
Aug.	47,802	10,304	37,498	7,077	600	740	600	335	5,892	7,197	9,520	394	809	382	71,044
Sept.	48,529	8,087	40,442	7,966	343	680	600	289	5,960	6,358	7,302	527	1,093	474	72,034
Oct.	47,770	7,312	40,458	7,681	591	598	650	300	5,916	6,956	6,352	667	669	449	71,287
Nov.	41,281	7,774	33,507	6,042	864	631	600*	311	5,334	6,401	8,001	654	658	238	63,241
Dec.	42,086	9,671	32,415	6,934	1,049	976	600*	335	6,254	7,196	8,476	721	1,365	353	66,674
1931:															
Jan.	41,579	11,029	30,550	7,039	1,315	770	542	424	5,923	7,348	10,328	1,218	994	295	66,746
Feb.	41,951	9,672	32,279	6,365	1,041	945	542	409	4,869	7,206	9,001	1,018	1,271	217	65,163
Mar.	48,589	12,009	36,580	5,881	1,209	930	542	536	5,434	7,104	11,258	1,233	1,338	430	72,475
Apr.	43,453	9,977	33,476	4,333	641	788	455	340	6,473	6,063	8,759	327	629	333	62,617
May	44,281	10,479	33,802	4,242	622	869	455	413	7,373	6,799	10,955	793	1,110	382	67,815
June	39,397	12,115	27,282	5,098	1,086	1,138	455	337	5,856	6,696	11,380	1,019	621	351	61,319
July	43,658	11,995	31,663	4,517	715	801	536	316	6,671	7,511	10,711	859	1,565	186	66,051
Aug.	42,832	9,063	33,769	3,763	406	692	535	210	6,397	7,044	8,641	1,097	856	241	63,651
Sept.	44,336	8,369	35,967	4,029	169	701	535	218	5,577	7,358	8,389	917	745	183	64,788
Oct.	45,911	9,955	35,956	5,547	286	872	500*	338	8,086	7,882	9,547	934	1,284	238	71,467
Nov.	48,012	9,529	38,483	4,609	408	830	500*	390	7,351	8,174	7,981	731	872	233	70,562
Dec.	35,741	11,314	24,427	6,346	572	1,115	500*	287	5,942	8,562	9,059	1,550	836	203	59,399
1932:															
Jan.	44,538	10,304	34,234	4,570		756		457	5,155	8,815	8,703		831		

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,809
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,128	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,626
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,436	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,498	37,855	30,447	25,621	12,433	15,134	8,480	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1930:															
Jan.	44,911	11,106	4,207	3,862	2,842	2,805	910	826	332	612	209	552	200*	577	73,951
Feb.	40,792	10,923	4,482	3,697	2,250	1,386	1,385	2,705	457	1,143	188	315	200*	239	70,162
May	40,012	9,862	5,233	4,379	2,593	2,699	1,279	1,153	975	678	358	322	200*	263	74,676
Apr.	43,036	13,058	5,006	4,488	2,303	2,769	2,067	929	678	1,431	158	461	200*	255	76,834
May	40,012	9,861	5,233	4,379	2,593	2,699	1,279	1,645	64	1,250	230	274	200*	282	70,002
June	37,374	9,645	4,458	3,794	2,579	2,677	1,378	1,574	67	691	343	507	200*	282	65,569
July	32,785	7,650	3,311	3,449	3,847	1,206	587	567	84	939	172	756	200*	342	55,394
Aug.	34,513	8,369	3,953	3,515	2,108	2,170	886	149	265	888	37	747	200*	450	58,250
Sept.	34,373	16,016	5,285	4,089	1,578	2,606	1,279	1,373	414	824	221	817	200*	411	69,486
Oct.	44,385	9,095	7,403	3,747	1,942	3,951	2,460	2,782	609	769	439	1,132	200*	351	79,265
Nov.	28,437	—250	13,662	3,074	2,128	4,003	2,510	2,140	464	596	364	1,180	200*	343	58,851
Dec.	35,202	12,249	7,149	3,105	1,347	4,104	2,815	544	950	814	205	647	200*	673	70,004
1931:															
Jan.	34,873	9,730	5,954	3,847	1,709	2,861	1,036	1,775	601	986	348	464	240	635	65,059
Feb.	32,572	12,226	4,510	3,374	1,927	3,264	1,393	1,022	495	785	157	476	201	366	62,768
Mar.	37,960	12,335	4,386	3,545	3,012	2,823	418	2,531	435	862	346	400	392	507	69,452
Apr.	42,212	9,440	4,346	3,054	2,070	3,478	528	1,450	457	515	333	495	208	324	68,910
May	33,271	8,212	2,880	3,231	2,748	3,755	1,023	1,034	884	1,153	86	495	180	711	58,663
June	43,730	5,636	4 002	3,504	2,112	2,988	1,462	3,279	1,112	1,058	272	577	207	607	70,546
July	42,293	5,366	3,301	3,226	2,592	3,065	809	3,141	627	1,507	41	429	145	1,074	67,816
Aug.	36,709	5,030	3,393	2,889	2,304	3,780	812	3,137	283	955	—57	321	160	413	60,129
Sept.	37,571	5,468	4,420	4,227	1,535	5,556	693	2,335	269	1,015	191	571	99	499	54,449
Oct.	39,820	5,775	3,909	3,220	1,567	3,980	571	4,076	765	792	185	710	193	695	66,258
Nov.	43,659	2,550	2,669	2,621	1,233	3,340	545	2,417	934	729	183	745	297	954	62,876
Dec.	51,323	4,402	2,696	2,950	2,452	5,093	859	4,474	787	652	135	677	283	932	77,715
1932:															
Jan.	32,028	5.065	2,588			5,782	627						462		

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are included in this compilation. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics Yards	Rubber Heels Pairs	Rubber Soles Pairs	Mechanical Goods Shipments Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	185,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1929	50,781,000	232,126,000	34,499,000	74,770,000
1930	42,681,000	178,059,000	29,514,000	58,465,000
1930:				
December	1,909,000	13,101,000	3,021,000	3,338,000
1931:				
January	2,206,000	12,973,000	2,481,000	3,599,000
February	2,184,000	13,156,000	2,724,000	3,711,000
March	2,769,000	14,661,000	2,292,000	4,412,000
April	3,381,000	15,408,000	2,692,000	4,617,000
May	3,050,000	15,474,000	2,885,000	4,231,000
June	3,212,000	17,093,000	3,177,000	3,879,000
July	3,337,000	15,361,000	2,864,000	3,706,000
August	3,787,000	16,293,000	2,933,000	3,356,000
September	4,692,000	15,827,000	2,880,000	3,015,000
October	4,112,000	14,567,000	2,610,000	2,678,000
November	2,529,0000	11,455,000	2,840,000	2,300,000

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Liquid Latex (1)	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	3,332	2,213,964	—	—
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	—	—
1921	58	26,945	814	1,077,859	1,745	351,893	—	—
1922	127	57,040	812	978,765	2,335	403,812	—	—
1923	1,155	542,227	700	898,524	4,565	853,308	—	—
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	8,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,356
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1931:								
Jan.	—	—	46	31,870	355	58,897	291	70,708
Feb.	—	—	17	13,801	511	114,100	369	89,470
Mar.	—	—	66	23,568	625	127,803	395	75,285
Apr.	—	—	219	69,284	676	140,309	372	73,867
May	—	—	120	44,025	205	36,086	318	82,202
June	—	—	245	79,786	681	123,616	706	129,496
July	—	—	67	20,777	331	64,493	583	104,868
Aug.	—	—	73	30,207	652	100,536	364	60,358
Sept.	—	—	126	35,174	407	65,232	439	72,443
Oct.	—	—	100	13,846	415	75,219	267	43,238
Nov.	—	—	36	11,539	276	50,062	265	40,649
Dec.	—	—	93	37,815	643	62,657	282	41,771
1932:								
Jan	—	—	54	14,095	633	81,396	331	40,613

(1) Latex import figures not available before 1924.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

		Consumption					Consumption		
Year	Production	Tons	% to Crude	Stocks*	Year	Production	Tons	% to Crude	Stocks*
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,334	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1925	132,930	137,105	35.6	13,203	1930	157,967	153,497	40.8	22,000
1930:									
Jan.	15,010	17,454	47.6	24,241	July	12,322	12,384	42.3	23,873
Feb.	15,846	14,559	44.5	24,248	Aug.	12,047	10,985	35.9	22,980
Mar.	17,400	15,241	42.2	24,415	Sept.	11,433	10,480	41.4	21,996
Apr.	17,828	16,904	42.0	24,527	Oct.	12,349	10,724	39.3	21,145
May	17,812	17,052	42.7	23,356	Nov.	10,763	8,816	37.5	24,007
June	15,714	14,063	40.8	24,449	Dec.	10,073	8,449	39.3	24,008
1931:									
Jan.	10,349	10,728	37.6	22,429	July	11,393	11,447	35.8	17,720
Feb.	10,871	10,800	37.5	18,878	Aug.	10,110	9,972	36.2	17,165
Mar.	12,988	12,524	38.8	18,875	Sept.	9,629	8,932	37.6	17,226
Apr.	13,267	11,745	35.0	18,356	Oct.	9,482	8,126	36.6	17,741
May	13,478	13,108	34.6	18,088	Nov.	7,892	7,492	32.6	17,662
June	14,066	13,045	34.4	18,505	Dec.	8,876	6,812	31.8	19,257
1932:									
Jan.	8,753	8,440	30.2	18,712					

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,869 tons in 1929
(Rubber Manufacturers' Association figures raised to 100%)

REVIEW DESK

Books, New Publications, Catalogues, Etc.

COTTON CLOTH FOR RUBBER AND PYROXLYN COATING. Commercial Standard CS32-31. Published by the U. S. Bureau of Standards, Dept. of Commerce. Copies 5 cents. Government Printing Office, Washington, D. C. 1931. 14 pp.

The pamphlet details the specifications of the accepted standard for cotton cloth for rubber and pyroxylin coatings and covers the construction, quality, sizing, methods of test, and labeling of such products. The standard as adopted has had the endorsement of business firms and trade associations interested in this line of manufacture.

L'EBANITE. By R. Ariano. Printed in Spanish. Reprinted from *Politecnico* No. 12, and published by Casa Editrice Dott, Francesco Vallardi, Milan, Italy. 1931. 16 pp.

The author reviews the history of ebonite and scientifically treats of its composition, mechanical qualities, resistancy to abrasion and other properties. He also details the manufacturing processes.

INDUSTRIAL CHEMICALS. Published by American Cyanamid Company, New York City, N. Y. 1932. 28 pp. For free distribution.

The pamphlet constitutes a catalog of chemical products manufactured by the publishers and its subsidiaries, classified under the various industries in which they are used.

SUBMARINE TELEPHONE CABLE. Reprinted from *The Electrician*, Nov. 27, 1931, London, and published by Simplex Wire & Cable Company, Boston, Mass. 1932. 8 pp. For free distribution.

This is a treatise on the design, manufacture and testing of rubber insulated, low capacitance, continuously loaded cables, built for the United States Coast Guard. The authors are H. E. Rowand, of the U. S. Coast Guard Service and E. W. Davis and G. J. Crowdes, of the Simplex Wire and Cable Company. These submarine telephone cables are adopted for use in circuits where low transmission losses are essential, but where the use of loading coils and other supplementary equipment for improving transmission is impractical. The type of cable described is of simple, rugged construction and can be manufactured and installed at moderate cost.

A METHOD OF MAKING ELECTRICAL CONTACT WITH EBONITE AND SOFT RUBBER FOR INSULATION TESTS. Reprinted from the *Transactions of the Institution of the Rubber Industry*, Vol. 6, No. 1, and published by Acheson Oildag Company, Port Huron, Mich. 1932. 6 pp. For free distribution.

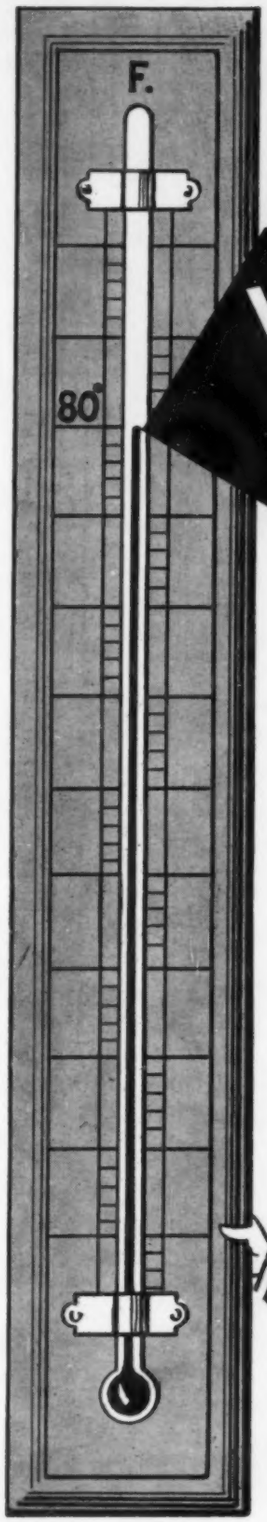
The paper was originally read before the Manchester (England) Section of the Institution of the Rubber Industry, January, 1930, and details the advantages of "Aquadag," a colloidal suspension of graphite, as being the best agent used in making these tests. This product is made by the publishers. It was found that the dried coating of graphite left on evaporation of water from "Aquadag" formed a convenient electrode for electrical measurements under a variety of conditions.

AIR CONDITIONS AND THE COMFORT OF WORKERS. Industrial Health Series, No. 5. Published by the Policyholders Service Bureau, Metropolitan Life Insurance Company, New York City, N. Y. 1932. 20 pp. For free distribution.

The report describes simple methods of measuring humidity and air motion, and explains how air is "conditioned" for comfort and efficiency. According to the report, extensive researches have been made on human subjects exposed to unusual temperatures and humidities under accurately controlled environmental conditions. These have shown how and to what extent man loses his physiological efficiency beyond certain temperature limits. The experiments and the limits are discussed in detail. Methods of removing excessive heat and moisture, and of cleaning the air are also described.

IMPROVING DEALER ACCOUNTING PRACTICES. Published by Policyholders Service Bureau, Metropolitan Life Insurance Company, New York City, N. Y. 1932. 22 pp. For free distribution.

The pamphlet is a report on the methods used by manufacturers and wholesalers to improve the accounting practices of their retail outlets. The report particularly mentions the systems used by the United States Rubber Company, B. F. Goodrich Company and Goodyear Tire and Rubber Company, in assisting their dealers.



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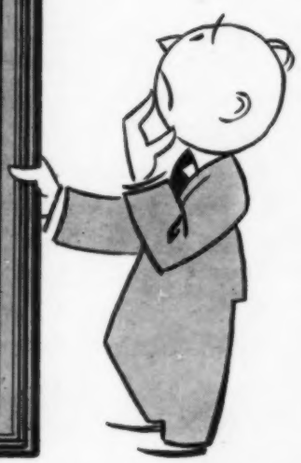
YOU ARE already familiar with the fact that di-ortho-tolylguanidine is a stronger accelerator than diphenylguanidine. It takes less of it to do the same work.

But—do you know that diphenylguanidine is more active than di-ortho-tolylguanidine at ordinary processing temperatures (below 220° F.)?

If scorching is not a problem, it doesn't matter which you use. But when cooling water is not cold, batches are large, and scorching holds up production and causes loss of material... *then* turn to di-ortho-tolylguanidine.

D. O. T. G. IS SAFER.



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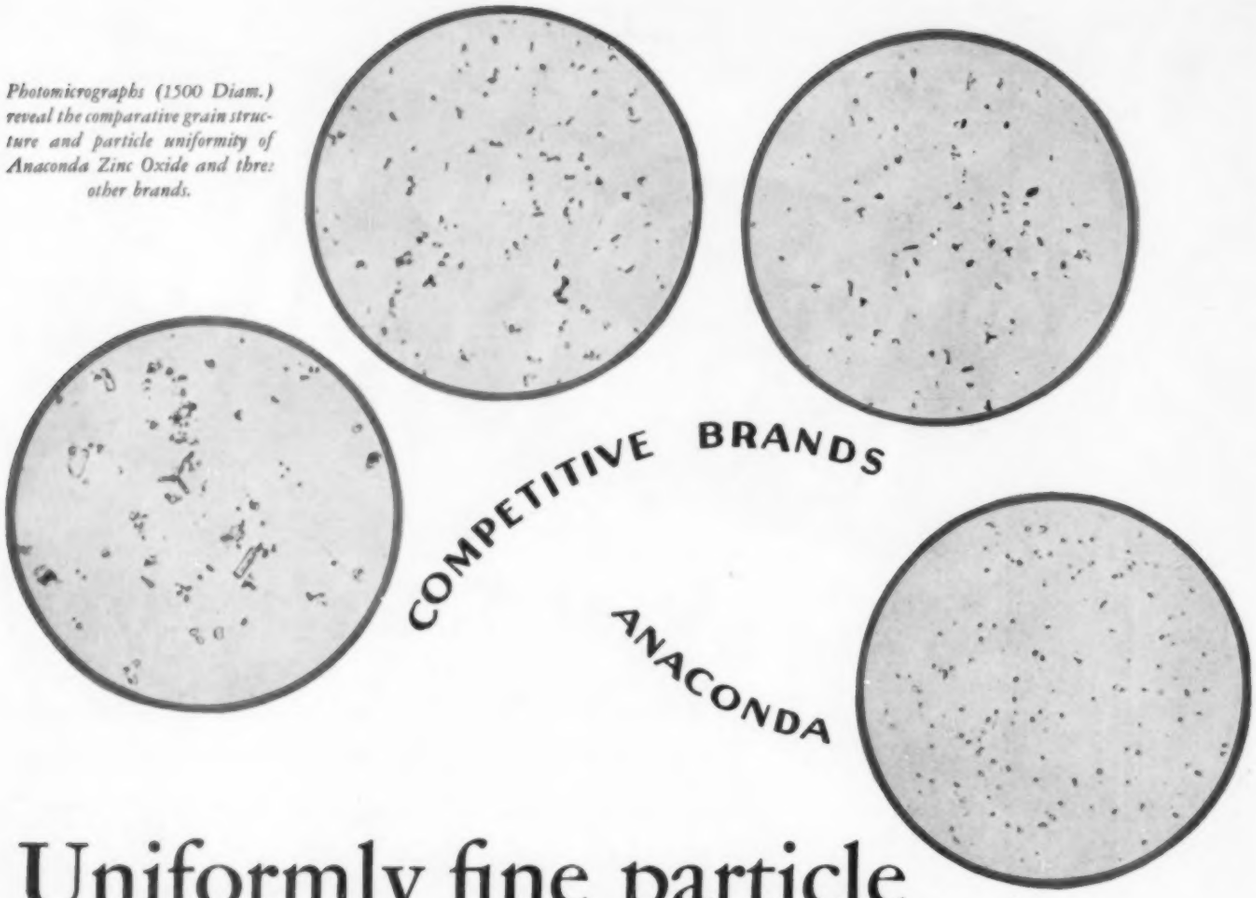
RUBBER CHEMICALS

E. I. DU PONT DE NEMOURS & CO., INC., *Rubber Chemicals Division*, WILMINGTON, DEL.

Photomicrographs (1500 Diam.) reveal the comparative grain structure and particle uniformity of Anaconda Zinc Oxide and three other brands.

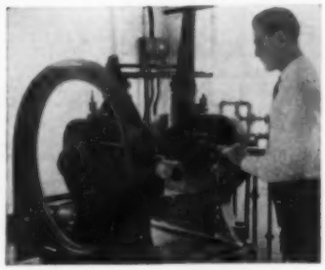


Uniformly fine particle size plus ease of incorporation

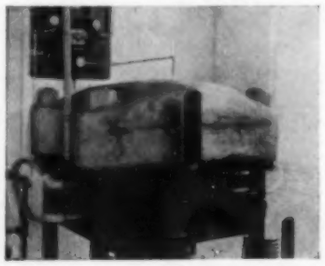
ANACONDA Zinc Oxide is fine in grain structure and uniform in particle size. These properties enable the rubber compounder to incorporate the material more easily. In the finished product, it results in maximum reinforcing value, gives the greatest resistance to abrasion.

Made from 99.99+% pure Zinc, all Anaconda Zinc Oxides are chemically pure. This super-purity results in the best activation and a high rate of cure.

We maintain a well-equipped laboratory, and our technical men welcome the opportunity of proving the superiority of Anaconda Zinc Oxides. For your own testing purposes, we will be glad to send samples from regular stock.



Some of Anaconda's laboratory equipment



Shipping points: East Chicago, Ind., and Akron, Ohio. Warehouse stocks are maintained in principal cities of the country.

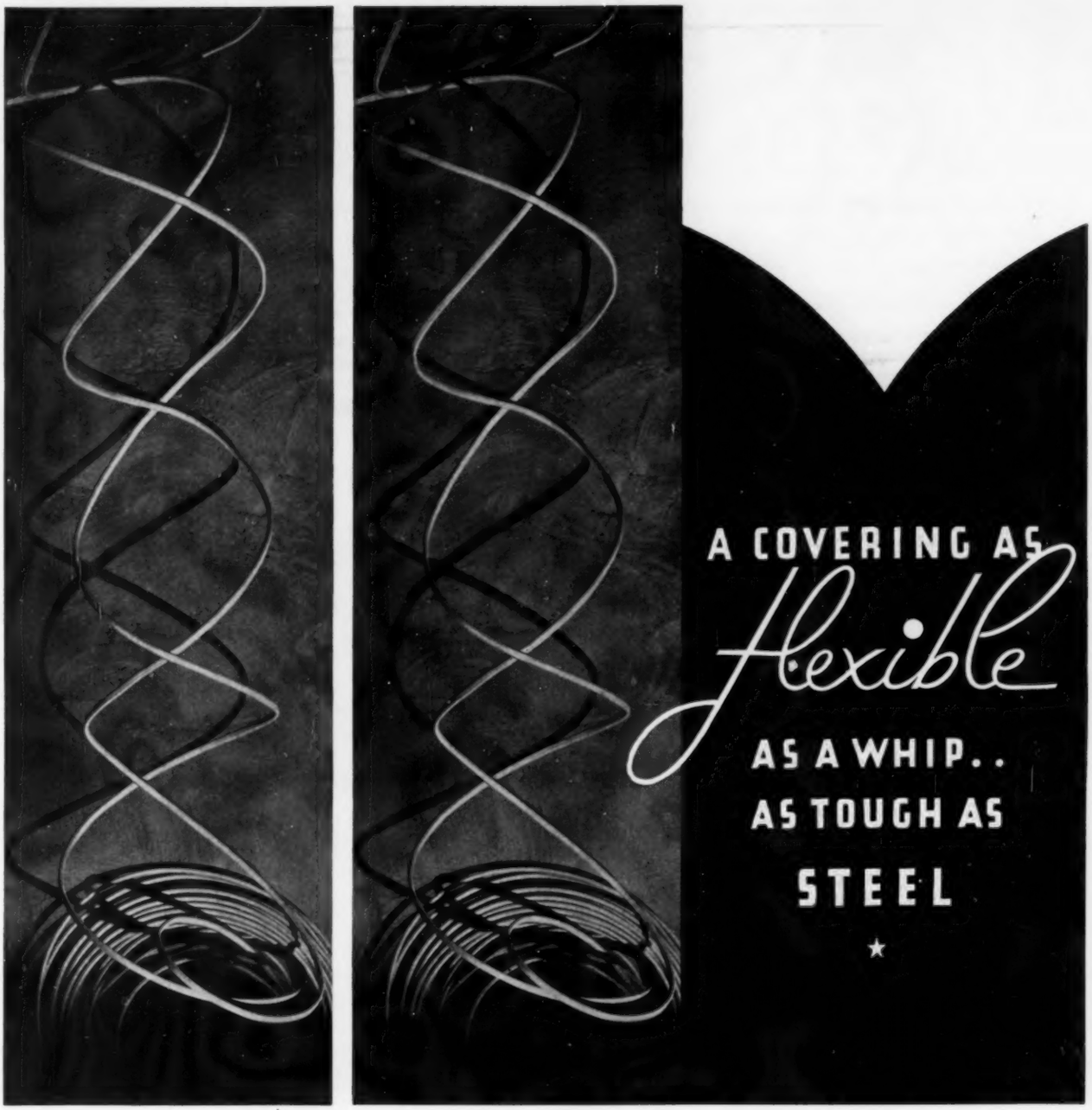
• • •

ANACONDA ZINC OXIDE DEPT.
OF I. L. R. CO.

General Sales Office: East Chicago, Ind.

District Offices:
Akron, Boston, Philadelphia, New York City.

ANACONDA ZINC OXIDES



Even if the price of Carbon Blacks varied greatly it would be risky to adopt a supply of dubious origin. Obviously, with prices so nearly identical, it is wise to obtain blacks from a source known for its standard of uniformity and high quality. Without these essentials a black is expensive at any price. United Carbon Company's Rubber Blacks are manufactured under such stringent conditions and subjected to such careful control that their high quality and uniformity can be confidently relied on. Samples on request to suit your particular need.

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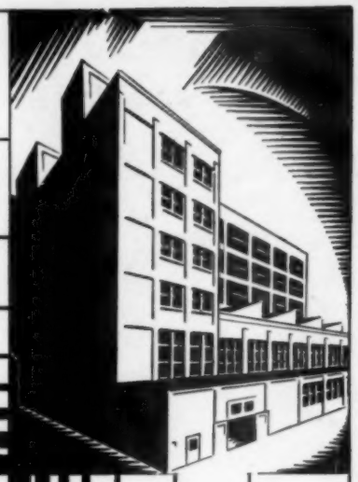

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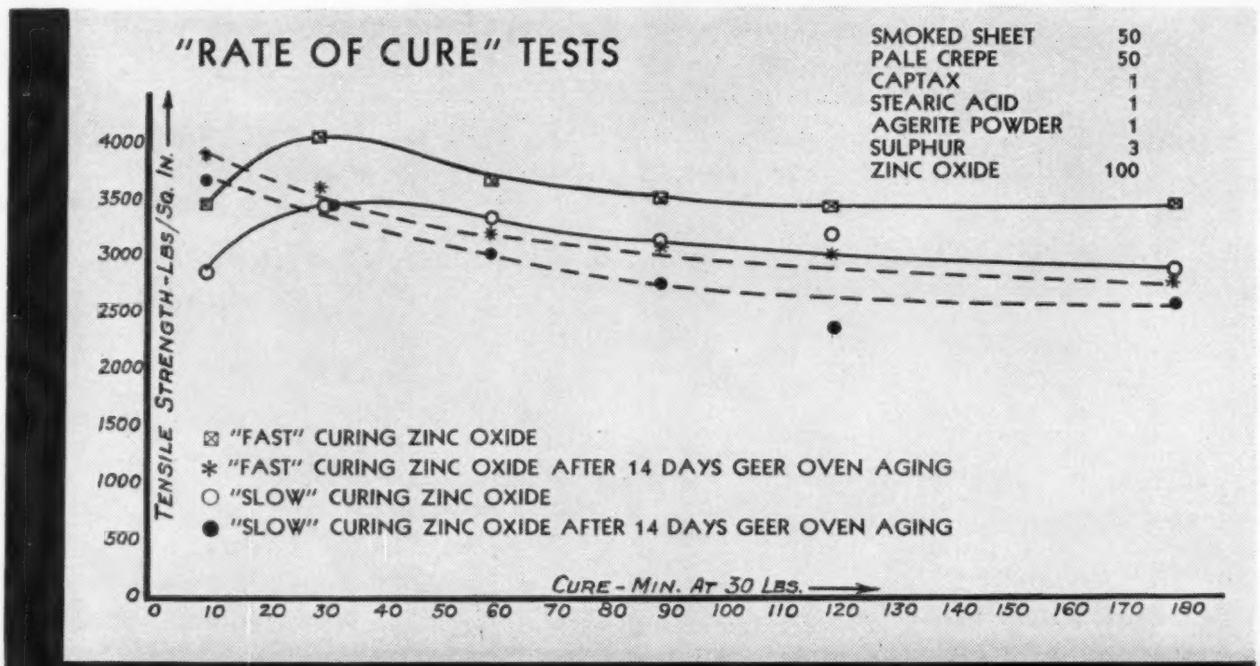
No. 2

of a series of advertisements showing a comparison of "fast" and "slow" curing Zinc Oxides with typical accelerators.



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The New Jersey Zinc Company supplies ZINC OXIDES for both types

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New Jersey zinc

The RUBBER AGE

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Rubber Roadways

NEW experiments in rubber roadway surfacing, which may lead to developments of far reaching importance, are being carried on abroad. Domestic companies are also interesting themselves in this potential outlet for rubber. The British Rubber Growers' Association, through its affiliated organization Rubber Roadway, Ltd., are doing much to further the application of rubber in roadway construction. A comprehensive article on the very latest developments along these lines, by E. G. Holt, chief of the Rubber Division, Department of Commerce, is a leading feature in this issue of THE RUBBER AGE.

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